

SEWER SYSTEMS

SUPPLEMENT TO REGIONAL STANDARD DRAWINGS ("S" SERIES)

NOTES

All material used must be on the City of San Diego MWWD "Approved Materials List."

DRAWING S-4


NOTES

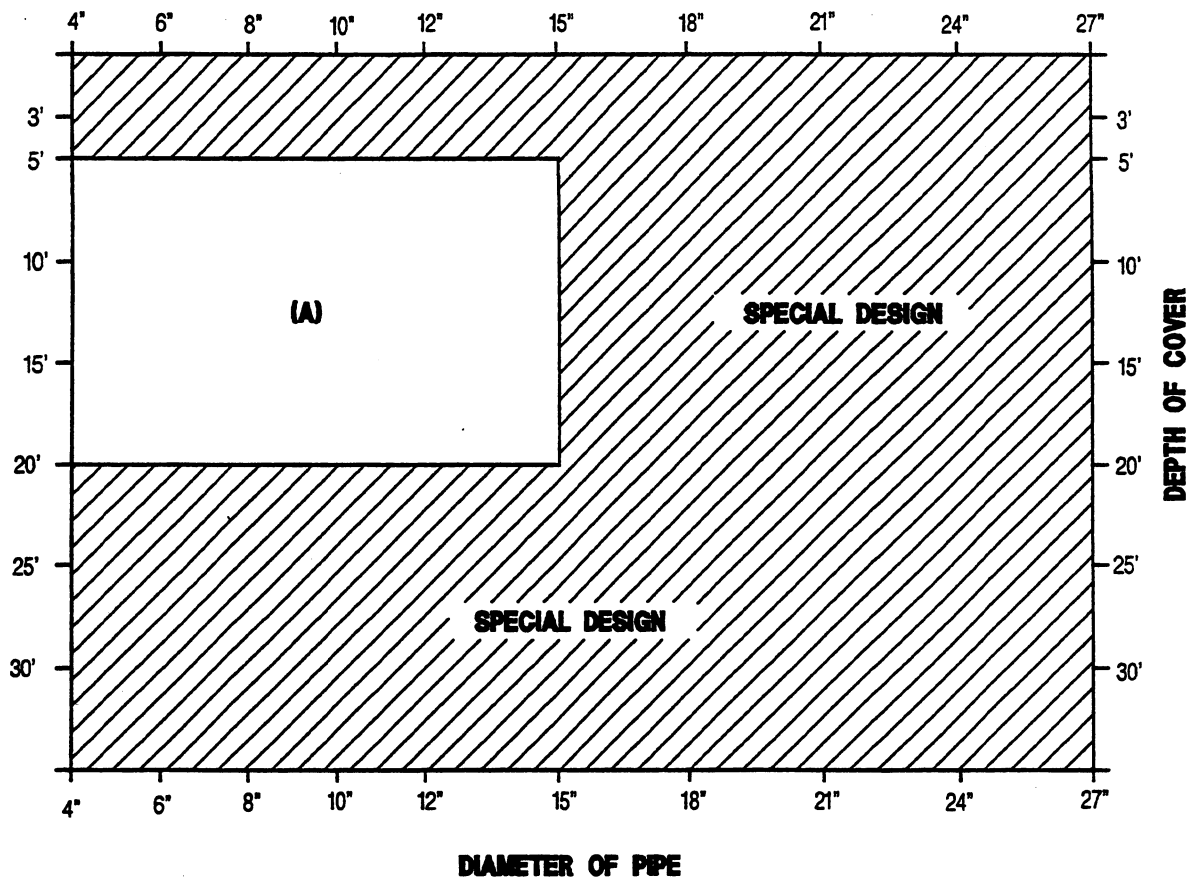
Amend note 1 to read: "For trenching in improved streets, use Standard Drawings SDG-107 and SDG-108 for trench resurfacing."

Add: 5. "All sanitary sewer pipes shall be bedded using a Type C rock envelope with 3/8 inch max. crushed rock (in lieu of 3/4 inch max.). Side wall clearance for pipe size encasement larger than 15 inches shall be 12 inches maximum or as specified on plans."

DRAWING S-10

Unless otherwise noted, Type "A" shall be used.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE  Chairperson R.C.E. 64572	12-9-03 DATE
ORIGINAL		M. Rollinger	5-20-92			
NOTES	SM	Oskoui	12/03	SUPPLEMENT TO REGIONAL STANDARD DRAWING ("S" SERIES)	DRAWING NUMBER	SDS-100



(A) SDR - 35 or pipe stiffness of 46 PSI per ASTM D2412

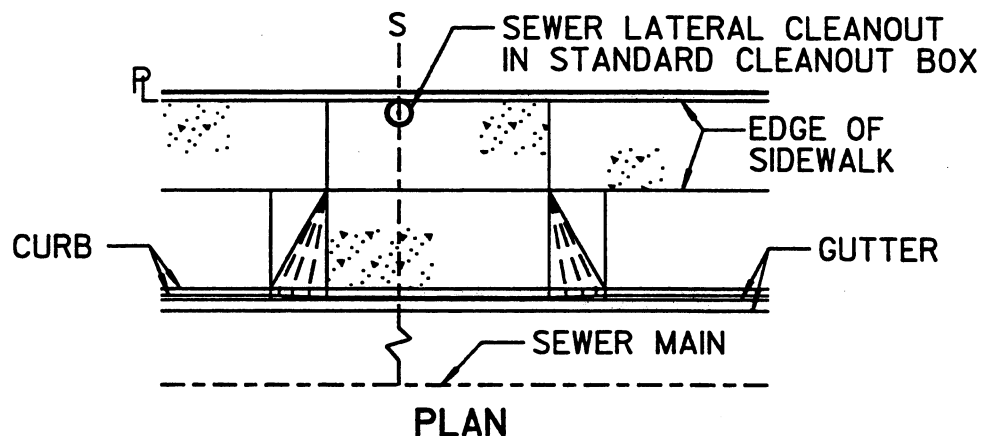
NOTE:

1. This standard drawing shall be used only where existing soil conditions are stable. Stable soil is defined as standard penetration test blow count equal to or greater than 13 blows per foot or shear strength greater than 750 psf. Obtained from unconfined compression test.
2. Standard design assumption : $K_b = .110$, $D_L = 1.0$, $E' = 750$ psi
 $W_c = \text{Prism load @ } W = 125 \text{ lb/ft}^3$
3. Bedding requirements per Regional Drawing S-4 Type C and SDS-100
4. Installations in ground water shall require a special design.

Design Ref.: ASCE Manuals and reports on Engineering Practice - No. 60 "Gravity Sanitary Sewer Design and Construction."

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE <i>James L. Palmer</i> COORDINATOR R.C.E. 25902 12-23-94 DATE
ORIGINAL		J. Mueller	6-15-83		
		J.P. Casey	8-25-86	PERMISSIBLE DEPTH OF COVER FOR PVC PIPE	DRAWING NUMBER SDS-101
		J.P. Casey	11-8-88		

REVISED 9/30/94

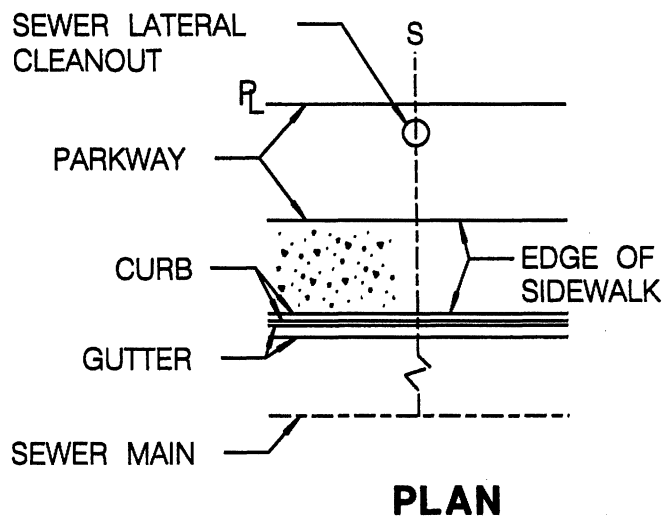
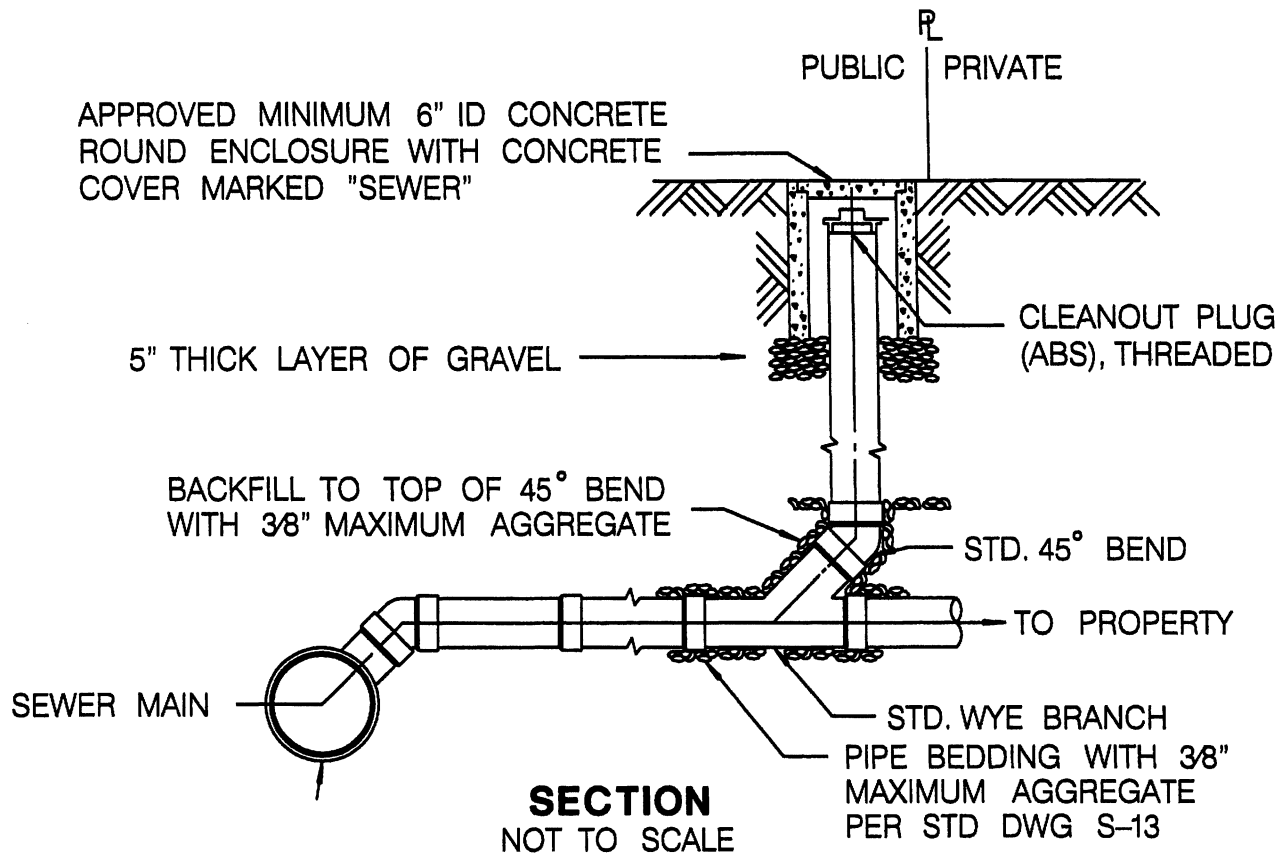


PLAN

1. RISER AND CLEANOUT PLUG SHALL BE SAME DIAMETER AS SEWER LATERAL.
2. CLEANOUT SHALL BE PLACED INSIDE A STANDARD CLEANOUT BOX (SEE S-3, TYPE B CLEANOUT BOX) WITH CAST IRON LID MARKED "CLEANOUT", OR EQUAL. EQUAL.

(NO SCALE)

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE
				SEWER LATERAL CLEANOUT	<i>Hon. R. H. 8/10/00</i> Chairman, R.C.E. Date <i>C-35390</i>
				(IN DRIVEWAY, PAVED ALLEY, SIDE WALK, OR OTHER AREA SUBJECT TO TRAFFIC)	
					DRAWING NUMBER SDS-102



NOTES:

1. RISER AND CLEANOUT PLUG SHALL BE SAME DIAMETER AS SEWER LATERAL.
2. CLEANOUT SHALL BE LOCATED WITHIN CITY RIGHT OF WAY, BEHIND THE SIDEWALK.

Revision	By	Approved	Date
DETAIL	SMS	Oskoui	12/03

CITY OF SAN DIEGO - STANDARD DRAWING

**SEWER LATERAL CLEANOUT
OUTSIDE TRAVELED WAY**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

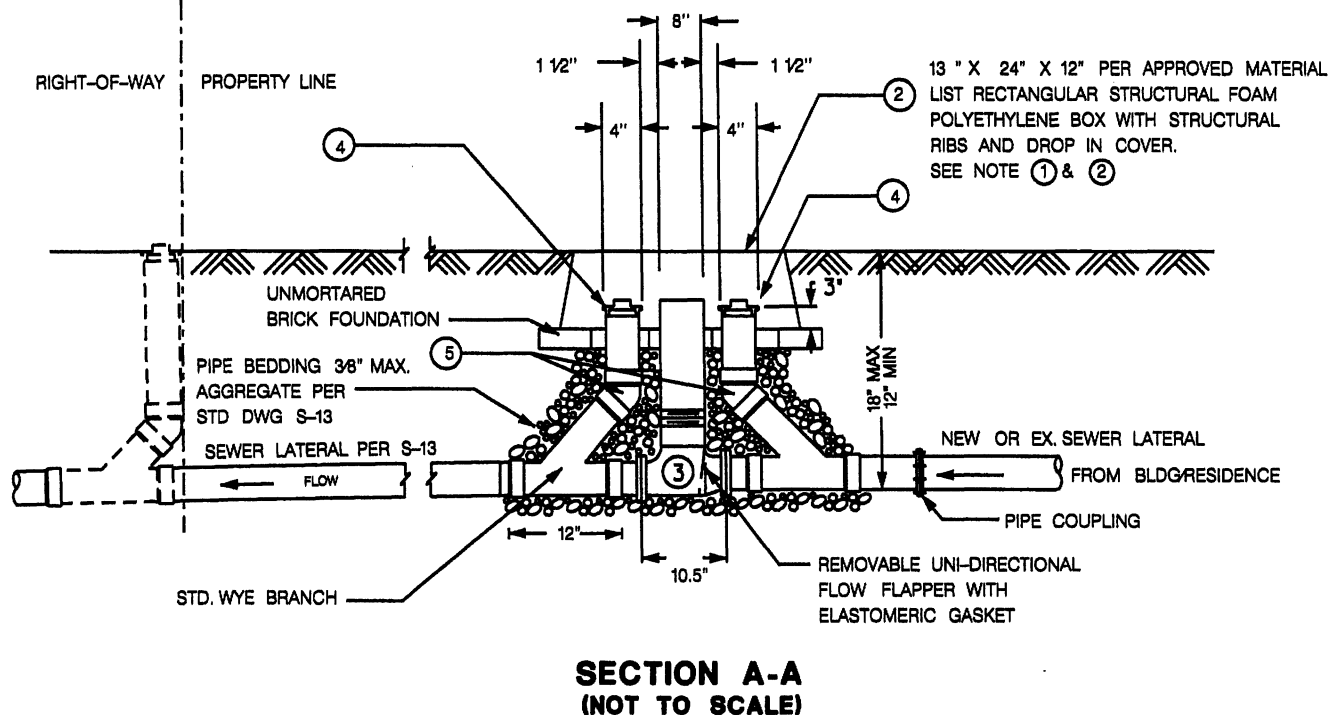
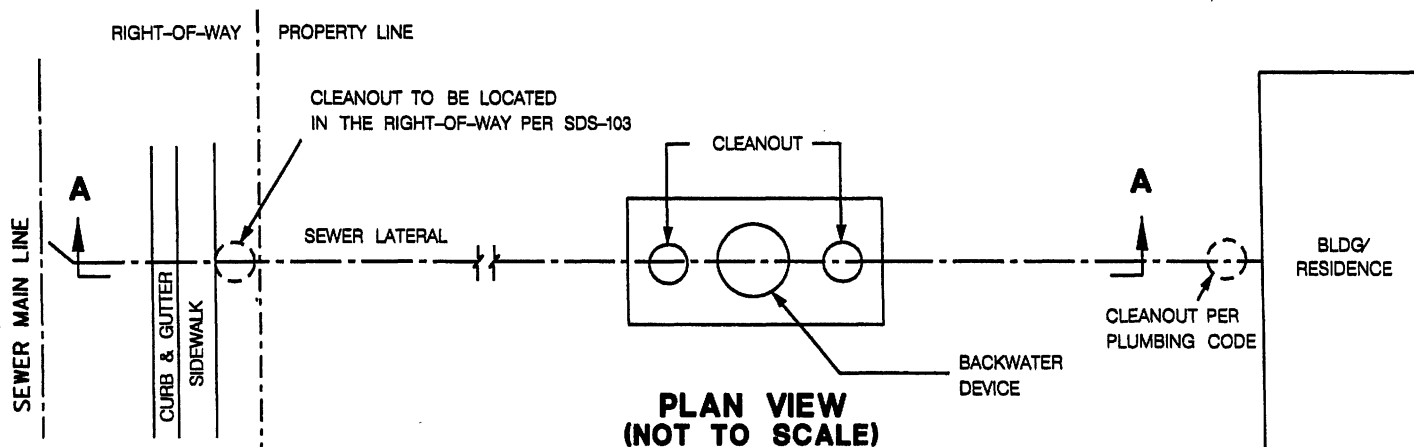
Chairperson RCE 64572

Date

DRAWING
NUMBER

SDS-103

R. C. 12-9-03

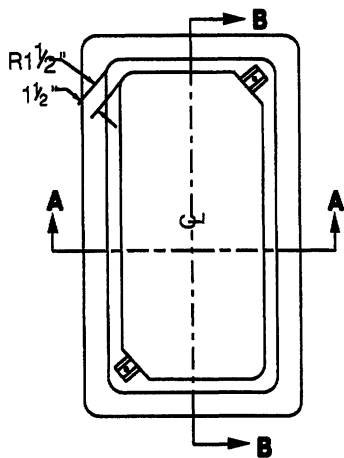


Notes:

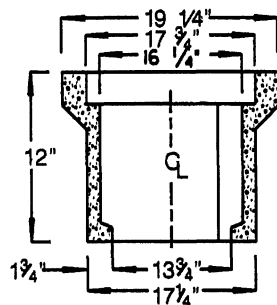
- ① WHEN BACKWATER DEVICE IS INSTALLED IN THE DRIVEWAY, SEE PAGE 2
- ② INSTALL VALVE BOX SO THAT IT IS FLUSH WITH EXISTING PAVEMENT SURFACE OR 1" ABOVE GROUND COVER.
- ③ PVC BACKWATER DEVICE AND ATTACHED PARTS SHALL BE PER THE APPROVED MATERIAL LIST.
- ④ CLEANOUT PLUG (ABS) THREADED.
- ⑤ STANDARD 45° BEND.
- ⑥ OVERSIZED POP-UP CAP.
- ⑦ THREADED PLUG.

SHEET 1 OF 2

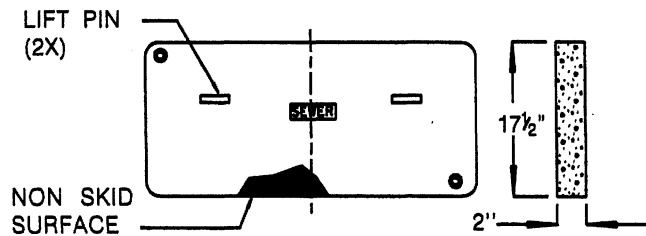
Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARD COMMITTEE
DETAIL	C9S	Oskoui	12/03		
				4" BACKWATER DEVICE	<i>[Signature]</i> 12-9-03 Chairperson RCE 64672 Date
					DRAWING NUMBER SDS-104



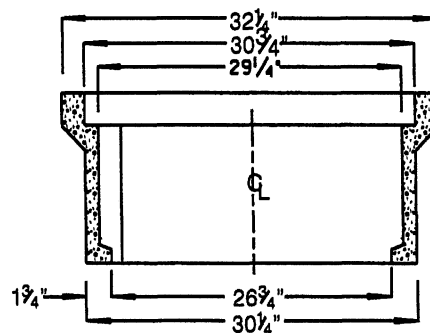
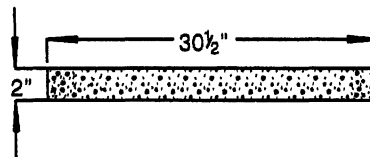
TOP VIEW



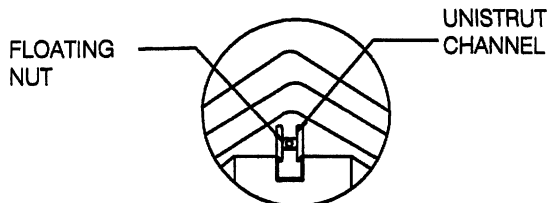
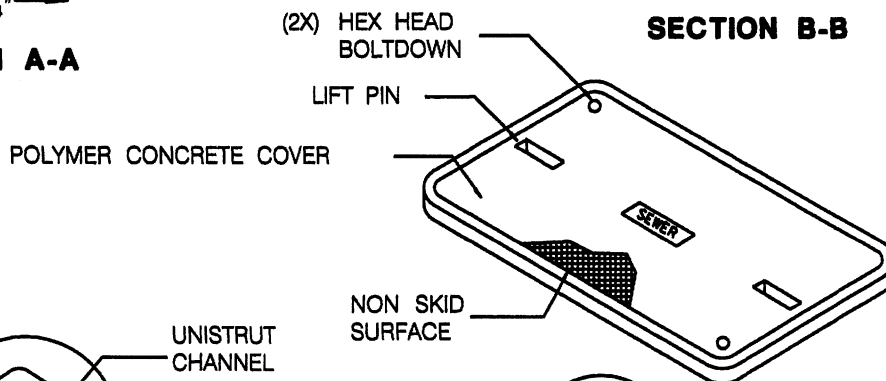
SECTION A-A



POLYMER CONCRETE COVER



SECTION B-B



DETAIL-A

POLYMER CONCRETE BOX

NOT TO SCALE

NOTE:

1. THE BOX & COVER IS 10K LOAD RATED.

SHEET 2 OF 2

Revised	By	Approved	Date
DETAIL	SMS	Oskoui	12/03

CITY OF SAN DIEGO - STANDARD DRAWING

4" BACKWATER DEVICE

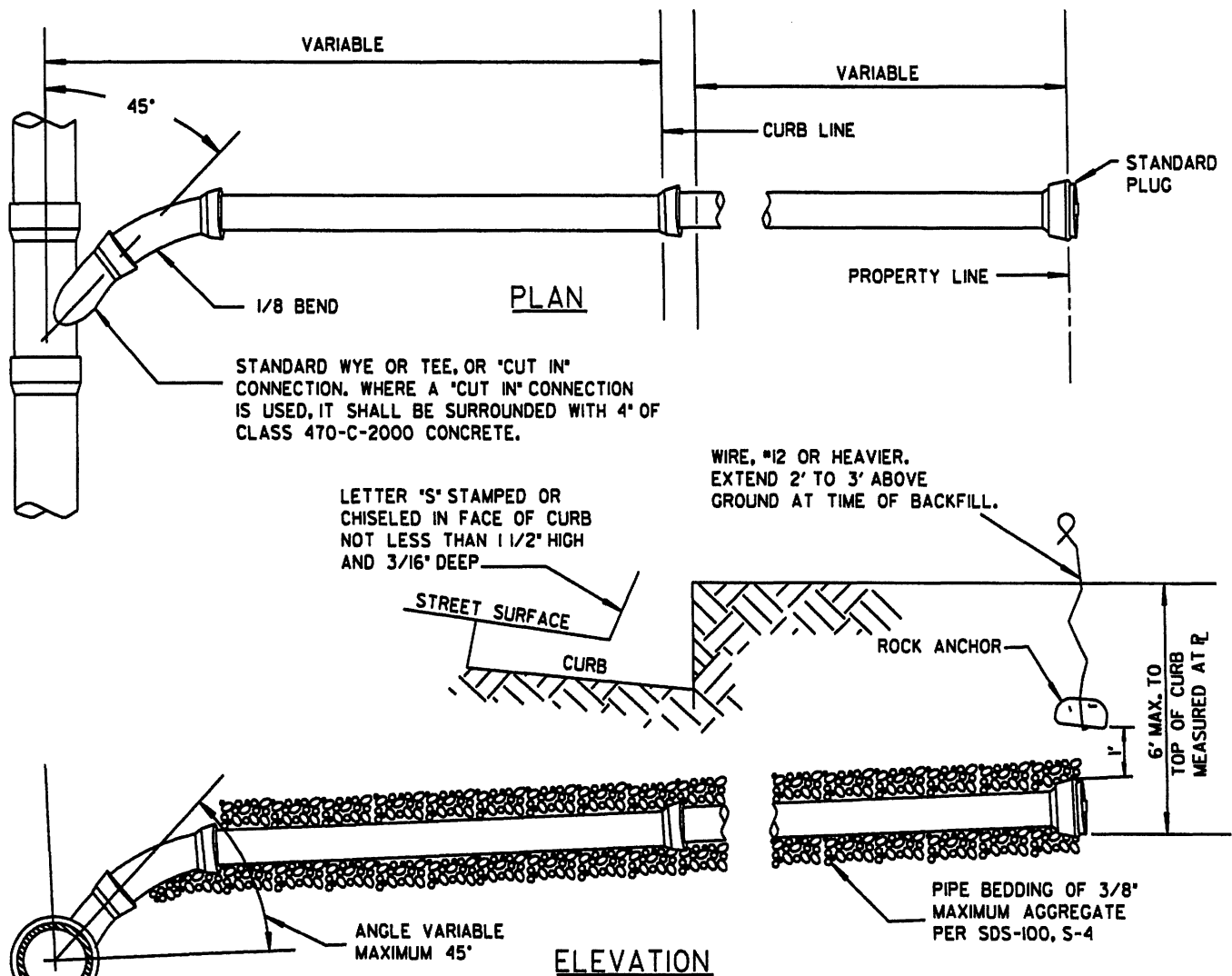
CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chairperson RCE 64572

Date

DRAWING
NUMBER

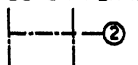
SDS-104



NOTES

1. IN NO CASE SHALL A LATERAL CONNECT TO THE SEWER MAIN DIRECTLY ON TOP OF THE PIPE.
2. SEWER LATERALS SHALL HAVE A MINIMUM SLOPE OF 2%.
3. ALL JOINTS ON SEWER LATERAL PIPE SHALL BE COMPRESSION TYPE OR APPROVED SOLVENT WELD.
4. LATERAL SHALL EXTEND TO PROPERTY LINE UNLESS OTHERWISE SHOWN ON PLANS
5. DO NOT TAP HOLE AND INSERT LATERAL PIPE DIRECTLY INTO MAIN. ALL CONNECTIONS SHALL BE MADE USING A SADDLE OR WYE CUT IN.
6. SEWER LATERAL SHALL HAVE 6 INCH METAL TAPE WITH GREEN LETTERING INDICATING 'SEWER' INSTALLED ABOVE THE ALIGNMENT OF THE PIPE FROM SEWER MAIN TO PROPERTY LINE, AT A MINIMUM 12 INCHES FROM THE FINISH GRADE AND A MINIMUM OF 12 INCHES FROM THE TOP OF PIPE.

LEGENDS ON PLANS



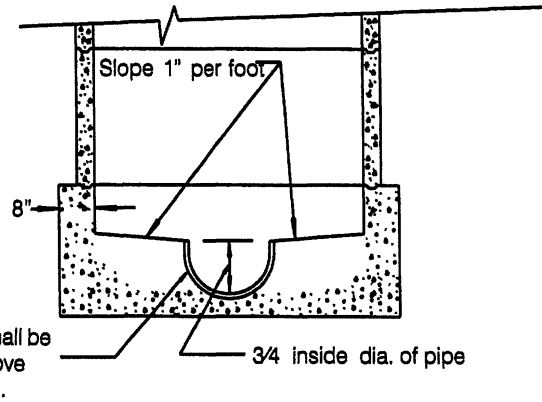
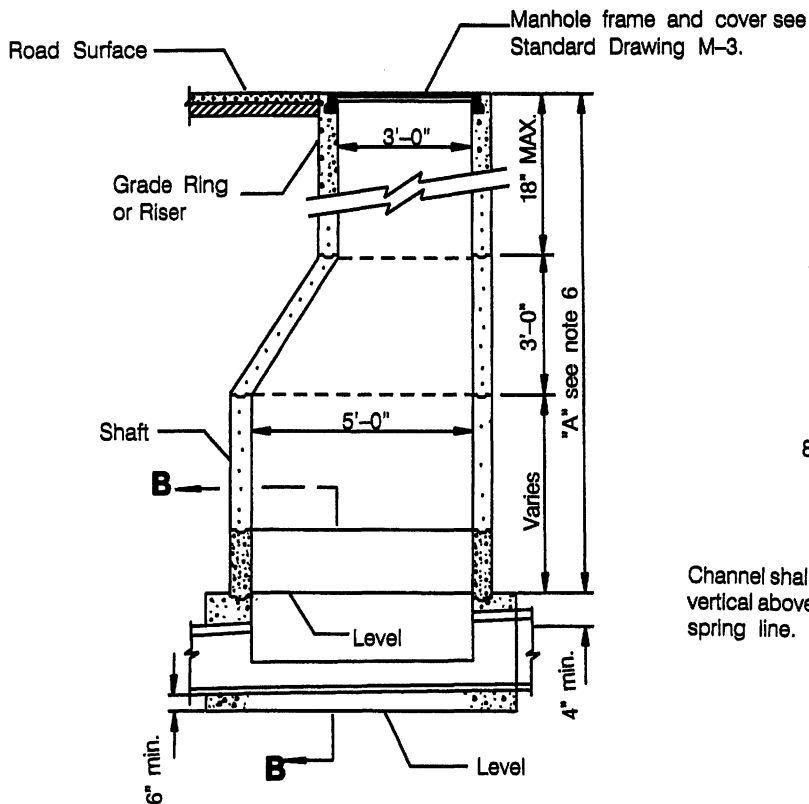
DETAIL SHOWING THE MANNER OF CONNECTING OPPOSITE LATERALS TO A SEWER MAIN. TWO CONNECTIONS SHALL NOT BE MADE IN THE SAME LENGTH OF PIPE.

Revision	By	Approved	Date
DETAIL	JFP	Oskoui	12/03

CITY OF SAN DIEGO - STANDARD DRAWING

HOUSE CONNECTION
(SEWER LATERAL)

CITY OF SAN DIEGO
STANDARDS COMMITTEE
Bl 12-9-03
Chairperson RCE 84572 Date
DRAWING NUMBER SDS-105



NOTES

1. Manhole frame and all joints shall be set in Class "C" mortar.
2. All precast components shall be manufactured in accordance with ASTM C-478
3. Vertical wall of cone shall be on the upstream side of the manhole.
4. Concrete base shall be 560-C-3250 concrete..
5. Approved water stop required for plastic pipe connectors.
6. Precast sections shall be used within dimension "A" as required, in order of preference listed:
 - A) Cone (notched for pipe if dimension "A" is less than 3 ft.)
 - B) 6" to 18" of 3' diameter grade rings and/or risers.
 - C) 5 ft. diameter shaft variable height.
7. Flexible pipe joints shall be required within 12 inches of inside face of manhole, except for plastic pipe.
8. All patching within manhole base shall be epoxy mortar,
9. Prior approval of precast base is required by the Agency.

LEGEND ON PLANS



Revision	By	Approved	Date
DETAIL	SMS	Oskoui	12/03

CITY OF SAN DIEGO - STANDARD DRAWING

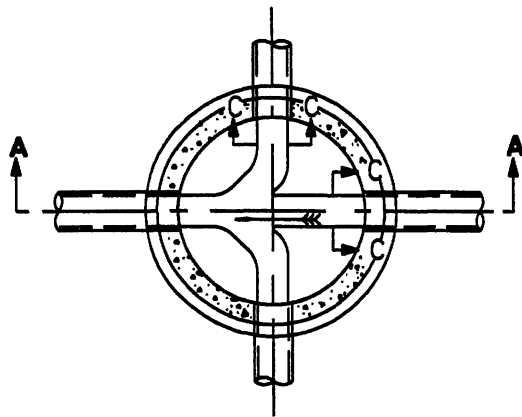
MANHOLE 5' X 3' DIAMETER

CITY OF SAN DIEGO
STANDARDS COMMITTEE

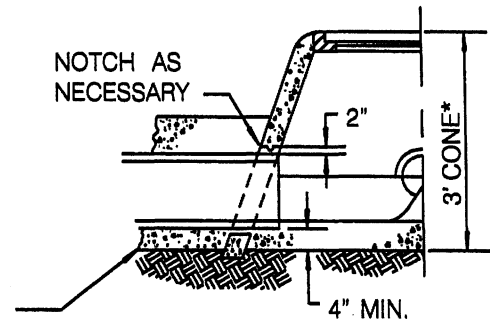
Chairperson RCE 64572

Date

DRAWING
NUMBER **SDS-106**

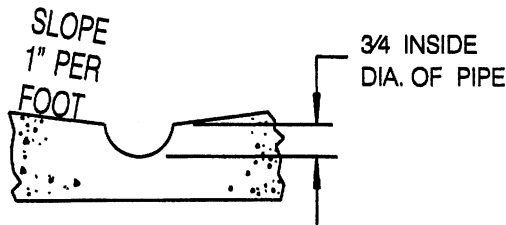


SECTION B-B



CONCRETE
ENCASEMENT
OR BACKFILL

* EITHER CONCENTRIC OR
ECCENTRIC CONE MAY BE USED

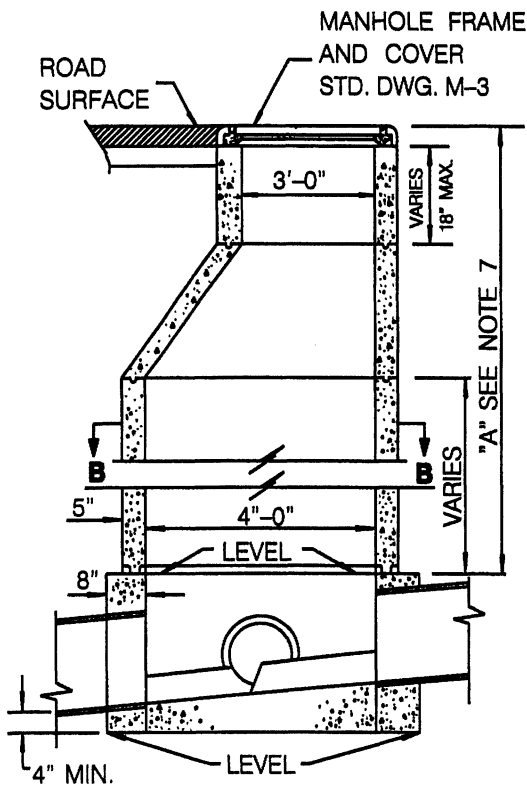


SECTION C-C

HALF SECTION SHALLOW MANHOLE

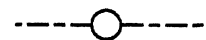
NOTES

1. ALL RISER JOINTS SHALL BE EPOXY MORTARED.
2. ALL PRECAST COMPONENTS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478.
3. VERTICAL WALL OF CONE SHALL BE ON THE UPSTREAM SIDE OF THE MANHOLE.
4. CONCRETE BASE SHALL BE 560-C-3250.
5. APPROVED WATER STOP REQUIRED FOR PLASTIC PIPE CONNECTIONS.
6. FLEXIBLE JOINTS SHALL BE REQUIRED WITHIN 12" OF INSIDE FACE OF MANHOLE (EXCEPT FOR PLASTIC PIPE).
7. PRECAST SECTIONS SHALL BE USED WITHIN DIMENSION "A" AS REQUIRED, IN ORDER OF PREFERENCE LISTED:
 - A) CONE (NOTCHED FOR PIPE IF DIMENSION "A" IS LESS THAN 3FT.
 - B) 3" TO 18" OF 3' DIAMETER GRADE RINGS AND /OR RISERS.
 - C) 4FT. DIAMETER SHAFT VARIABLE HEIGHT.
8. ALL PATCHING WITHIN MANHOLE BASE SHALL BE EPOXY MORTAR.
9. PRIOR APPROVAL OF PRECAST BASE IS REQUIRED BY THE AGENCY.
10. MANHOLES SERVING 18 INCH DIAMETER PIPE AND LARGER SHALL USE PRECAST RISERS LINED WITH WHITE PVC SHEETS IMBEDDED WITH LOCKING EXTENSIONS TO THE CONCRETE WALL. THE BASE AND ALL REMAINING EXPOSED CONCRETE SHALL BE COATED WITH AN APPROVED POLYURETHANE COATING.



SECTION A-A

LEGEND ON PLANS



M.H. NO. 2

Revision	By	Approved	Date
DETAIL	JFP	Oskoui	12/03

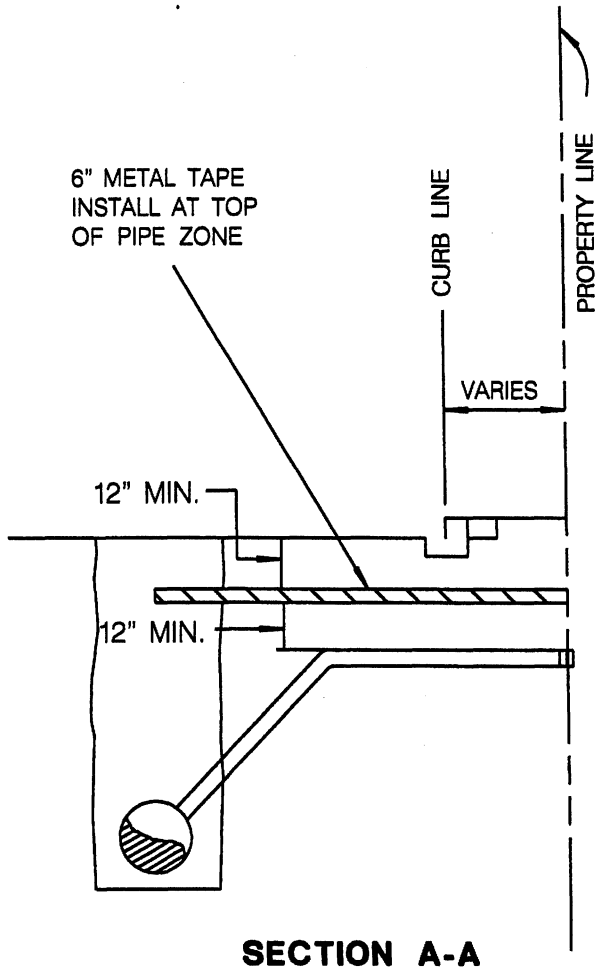
CITY OF SAN DIEGO - STANDARD DRAWING

**MANHOLE - 4' X 3' DIAMETER
(FOR 15" MAXIMUM DIAMETER PIPE)**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

Rh 12-9-03
Chairperson RCE 64572 Date

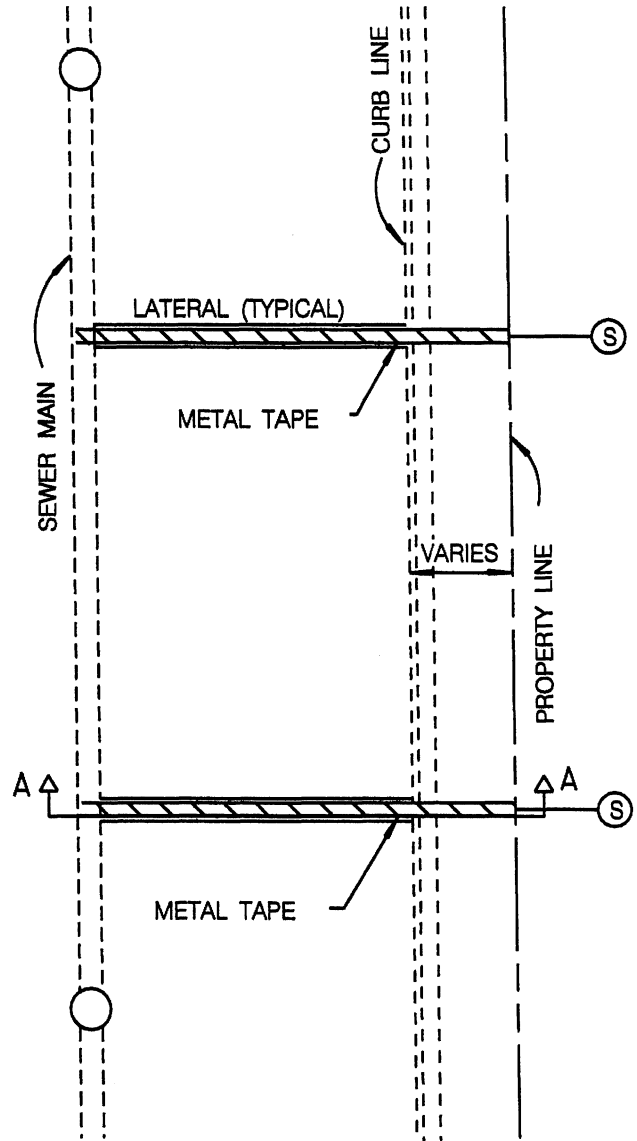
DRAWING
NUMBER **SDS-107**



SECTION A-A

NOTE

METAL TAPE SHALL BE INSTALLED
ABOVE TOP OF PIPE (ZONE)
APPROXIMATELY 12" BELOW
PAVEMENT SECTION.



PLAN

REVISION	BY	APPROVED	DATE
DETAIL	SMS	Oskoui	12/03

CITY OF SAN DIEGO - STANDARD DRAWING

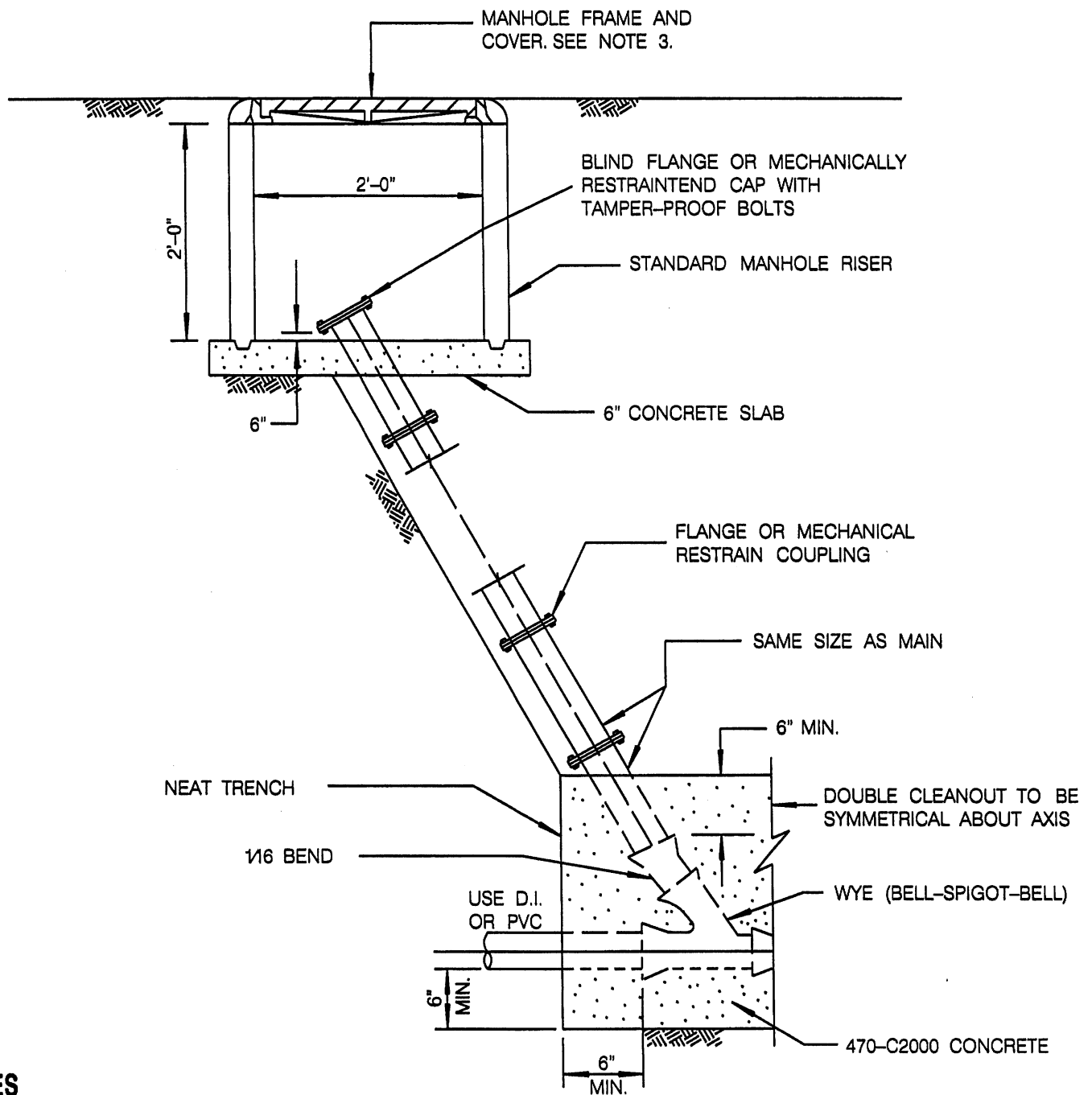
**METALLIC TAPE LOCATOR
FOR NON-METALLIC SEWER PIPE**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

Blh 12-9-03
Chairperson RCE 84572 Date

DRAWING
NUMBER

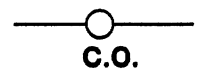
SDS-108



NOTES

1. SIMILAR POLYVINLYL CHLORIDE COMPONENTS MAY BE USED IN ACCORDANCE WITH A.S.T.M. STANDARD SPECIFICATION D-2241 AND D-3139.
2. CONCRETE SLAB SHALL BE 560-C-3250 CONCRETE.
3. USE HEAVY DUTY MANHOLE FRAME AND COVER, STANDARD DRAWING M-1, IN AREAS SUBJECT TO VEHICULAR TRAFFIC; USE LIGHT DUTY MANHOLE FRAME AND COVER, STANDARD DRAWING M-2, IN ALL OTHER LOCATIONS.
4. MINIMUM PIPE PRESSURE CLASS 200.

LEGEND ON PLANS



C.O.

Revision	By	Approved	Date
DETAIL	JFP	Oskoui	12/03

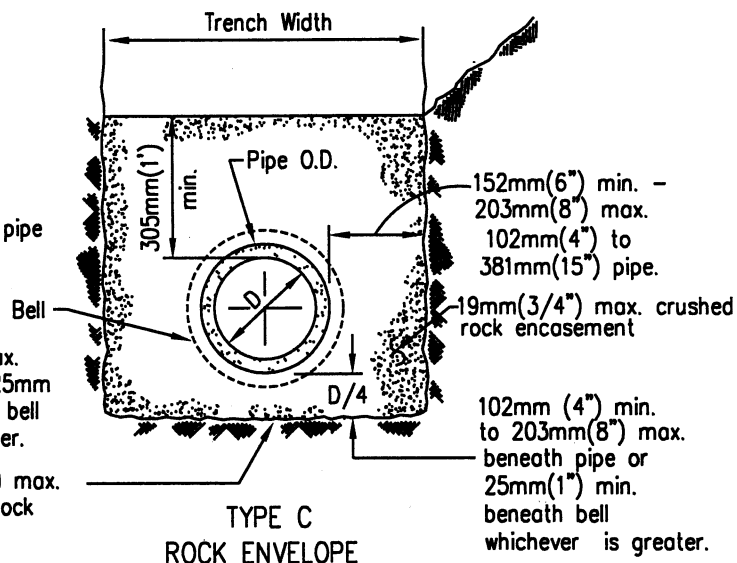
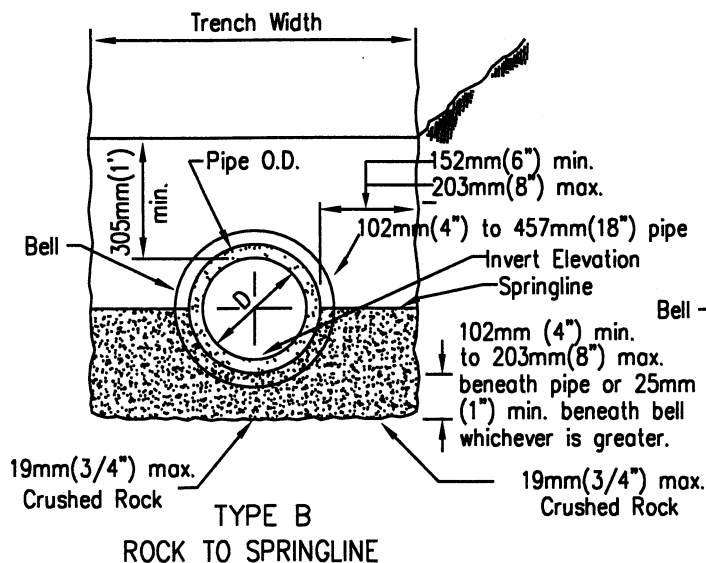
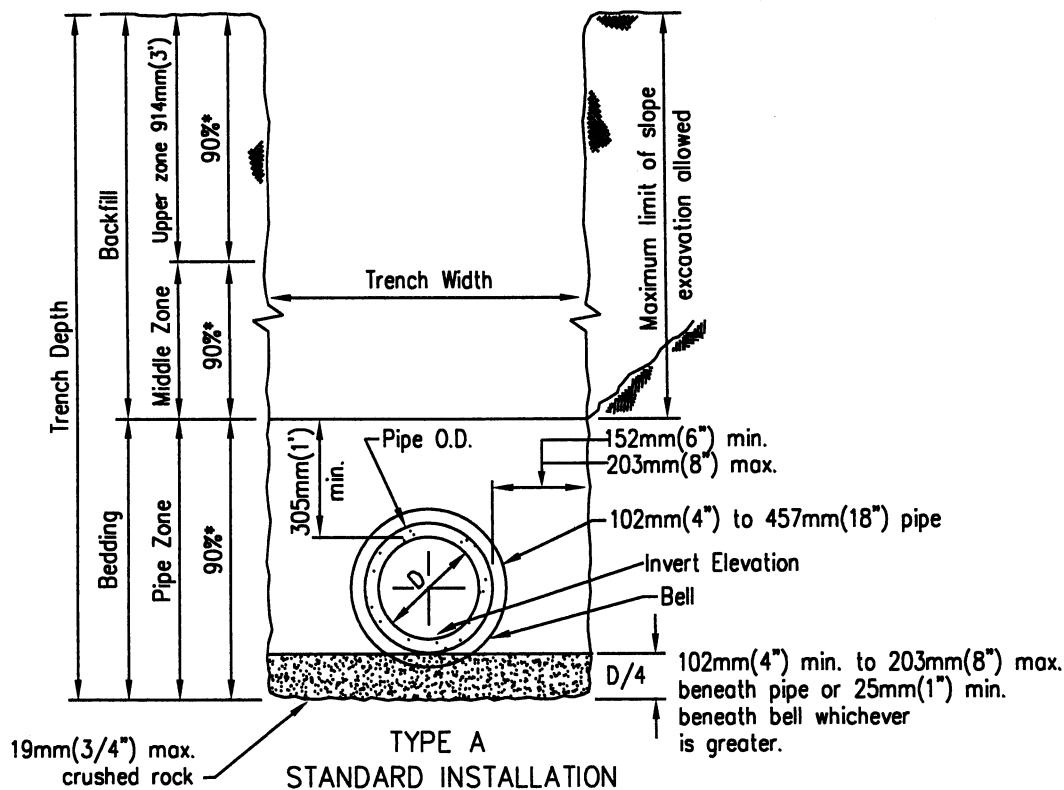
CITY OF SAN DIEGO - STANDARD DRAWING

CLEANOUT - SEWER FORCE MAIN

CITY OF SAN DIEGO
STANDARDS COMMITTEE

Blh 12-9-03
Chairperson RCE 64572 Date

DRAWING
NUMBER **SDS-109**



NOTES

1. For trenching in improved streets, see Standard Drawings G-24 or G-25 for trench resurfacing.
2. (*) indicates minimum relative compaction.
3. Minimum depth of cover from the top of pipe to finish grade for all sanitary sewer installations shall be 914mm(3') For cover less than 914mm(3'), see Standard Drawing S-7 for concrete encasement.
4. See Type A installation for details not shown for Types B and C.

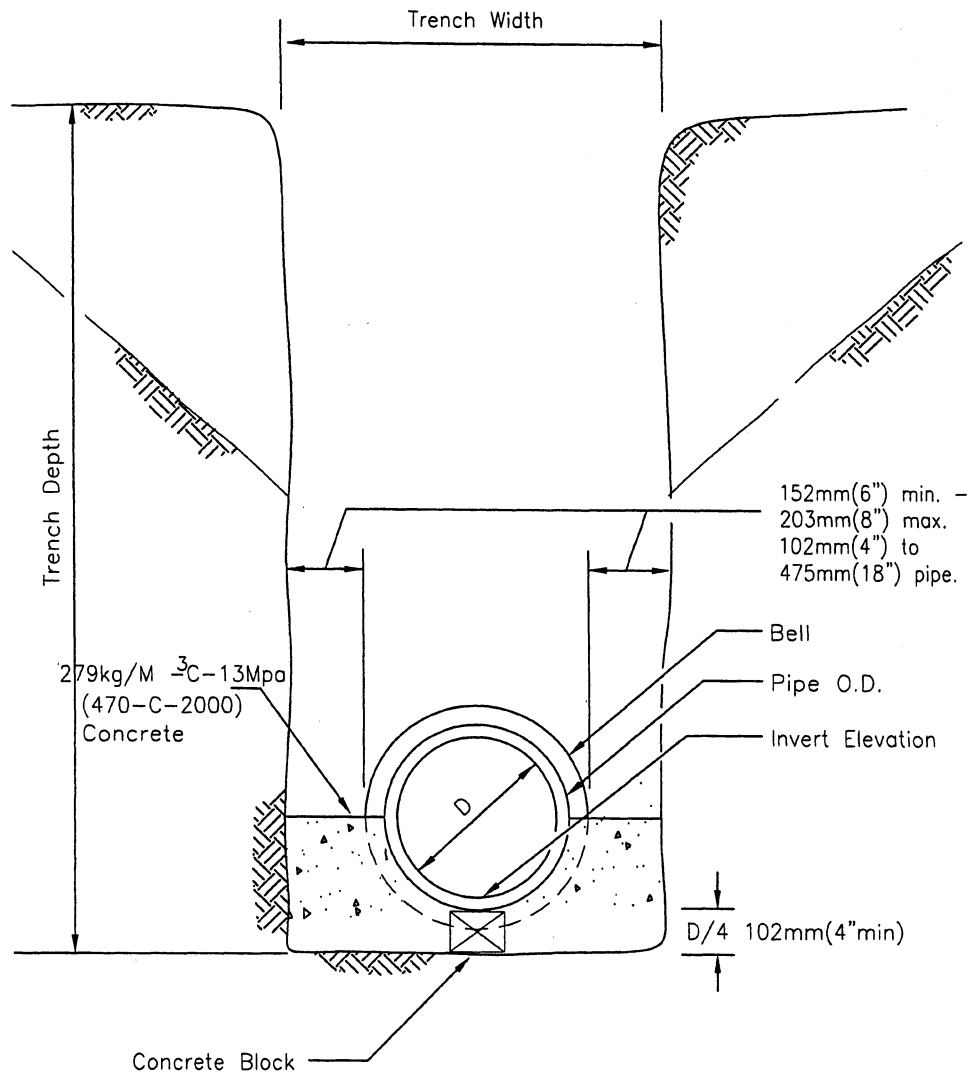
Revision	By	Approved	Date
Original	R.A.	A. Oskoui	12/06

CITY OF SAN DIEGO - STANDARD DRAWING

PIPE BEDDING AND TRENCH BACKFILL FOR SEWERS

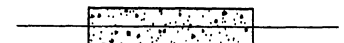
CITY OF SAN DIEGO STANDARDS COMMITTEE	
<i>M. Hall</i> 12/16/6	
COORDINATOR R.C.E 65271 Date	
DRAWING NUMBER	SDS-110

SEE SDS-100

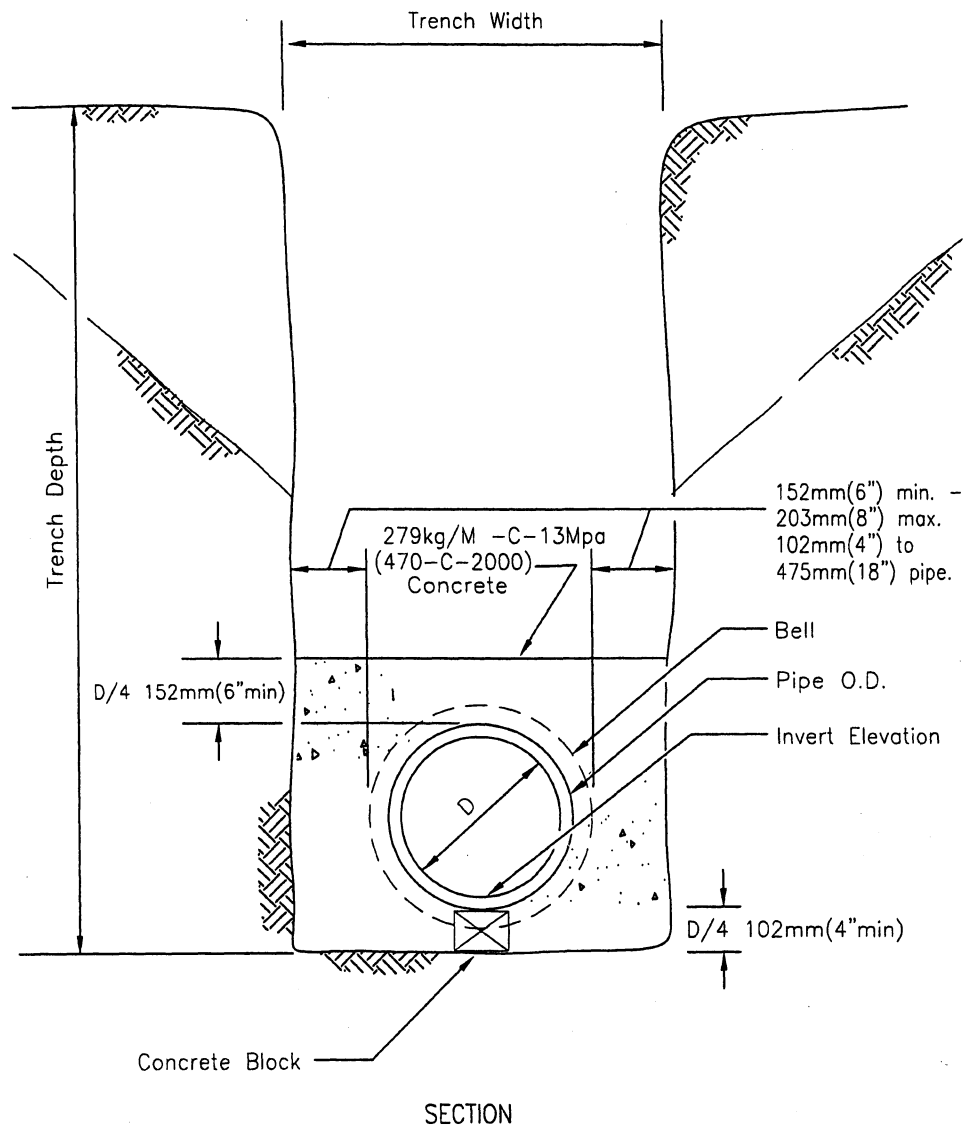


SECTION

LEGEND ON PLANS



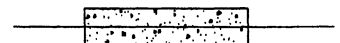
Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING		CITY OF SAN DIEGO	
Original	R.A.A. Oskoui		12/06			STANDARDS COMMITTEE	
				CONCRETE CRADLE		12/16/6	
						COORDINATOR R.C.E 65271 Date	
						DRAWING	
						NUMBER	
						SDS-111	



NOTE

Encase pipe to the nearest flexible joint.

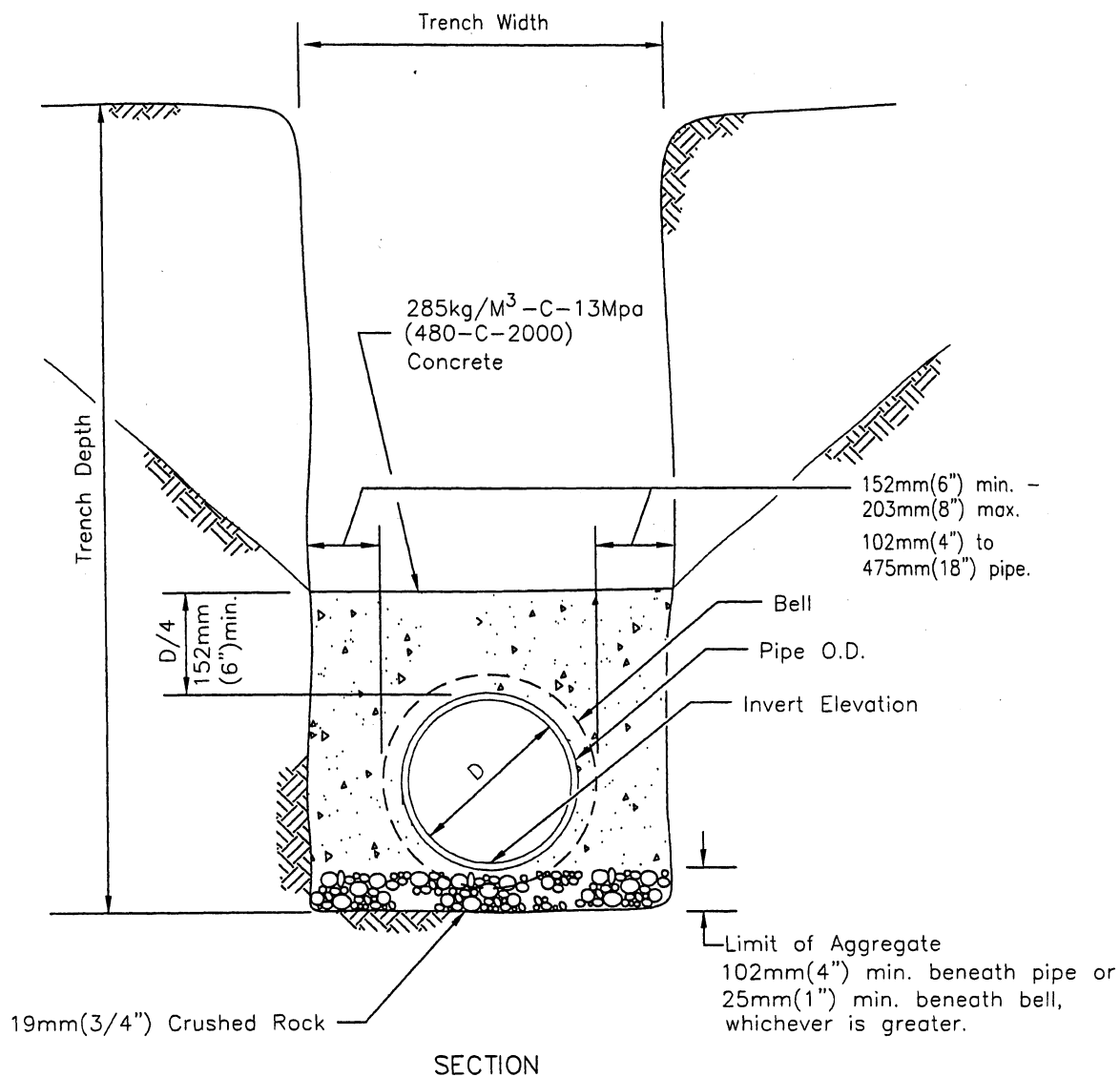
LEGEND ON PLANS



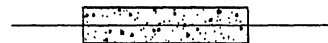
Revision	By	Approved	Date
Original	R.A. A. Oskoui		12/06

CITY OF SAN DIEGO - STANDARD DRAWING	
CONCRETE ENCASEMENT	

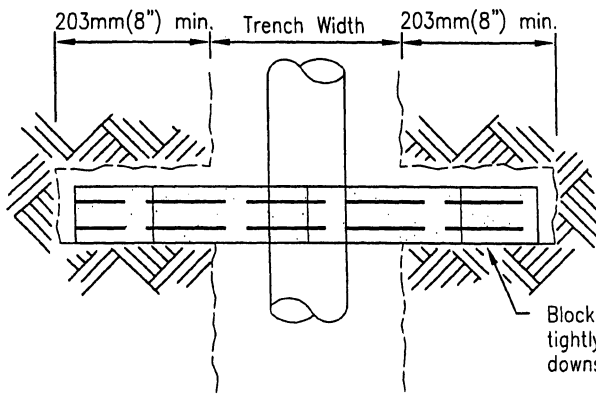
CITY OF SAN DIEGO STANDARDS COMMITTEE	
<i>H. Hual</i> 12/16/6	
COORDINATOR R.C.E 65271 Date	
DRAWING NUMBER	SDS-112



LEGEND ON PLANS



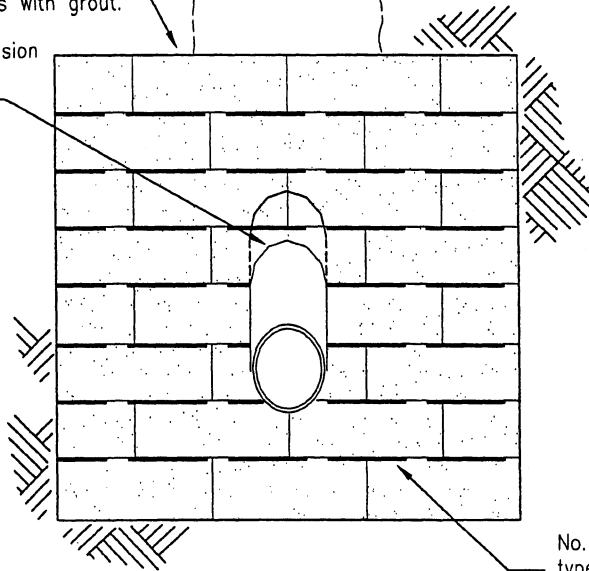
Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING		CITY OF SAN DIEGO STANDARDS COMMITTEE	
Original	R.A.	A. Oskoui	12/06			<i>M. Hase</i> 12/16/6	
				CONCRETE BACKFILL		COORDINATOR R.C.E 65271 Date	
						DRAWING	
						NUMBER	
						SDS-113	



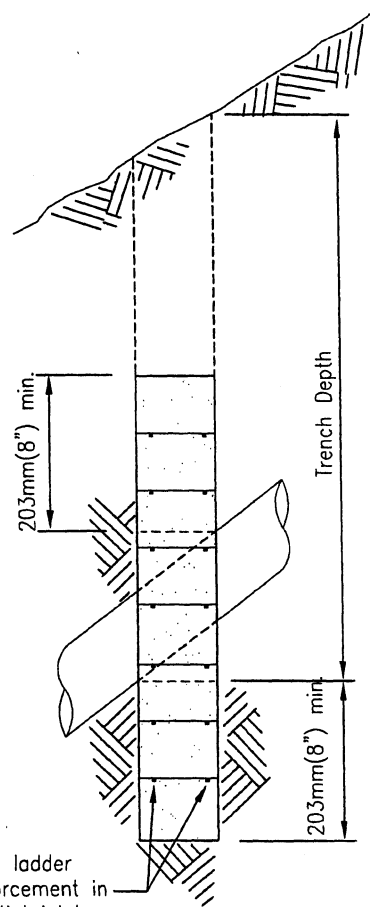
PLAN

203mm(8") x 203mm(8")
x 406mm(16") Concrete
Block. Fill cores with grout.

13mm(1/2") expansion
joint material or
jute around pipe.

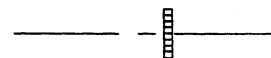


FRONT ELEVATION



SIDE ELEVATION

LEGEND ON PLANS



Revision	By	Approved	Date
Original	R.A.	A. Oskoui	12/06

CITY OF SAN DIEGO - STANDARD DRAWING

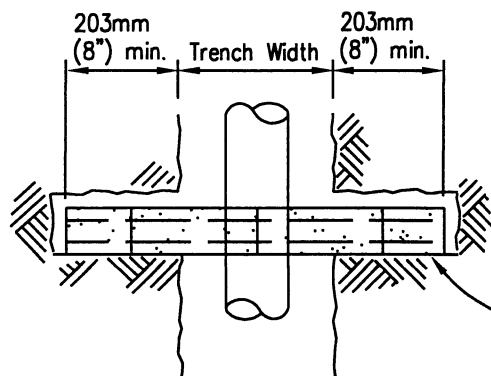
CONCRETE ANCHOR

CITY OF SAN DIEGO
STANDARDS COMMITTEE

M. Hume 12/16/6
COORDINATOR R.C.E 65271 Date

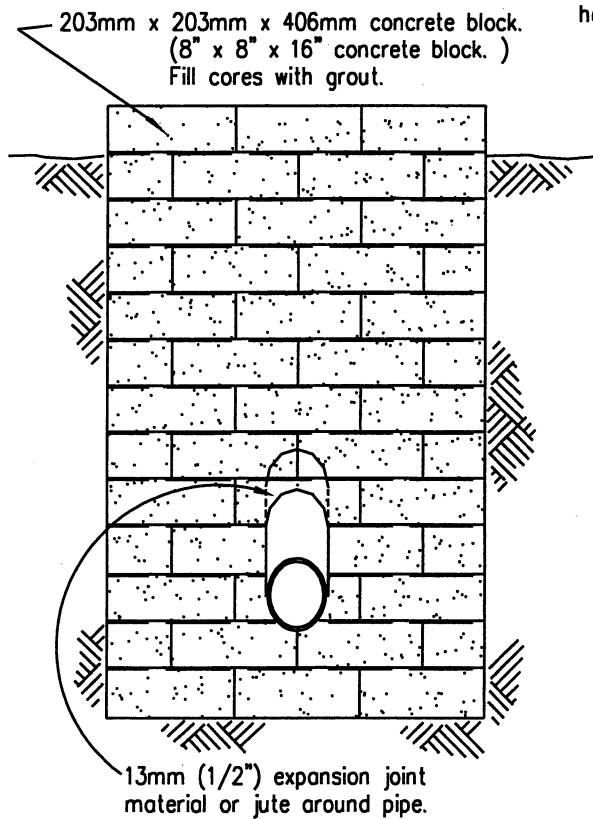
DRAWING
NUMBER

SDS-114



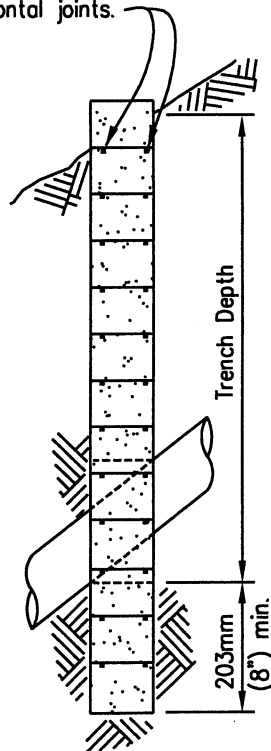
PLAN

Blocks to be laid tightly as possible to downstream side of notch.



FRONT ELEVATION

No. 9 wire ladder type reinforcement in all horizontal joints.

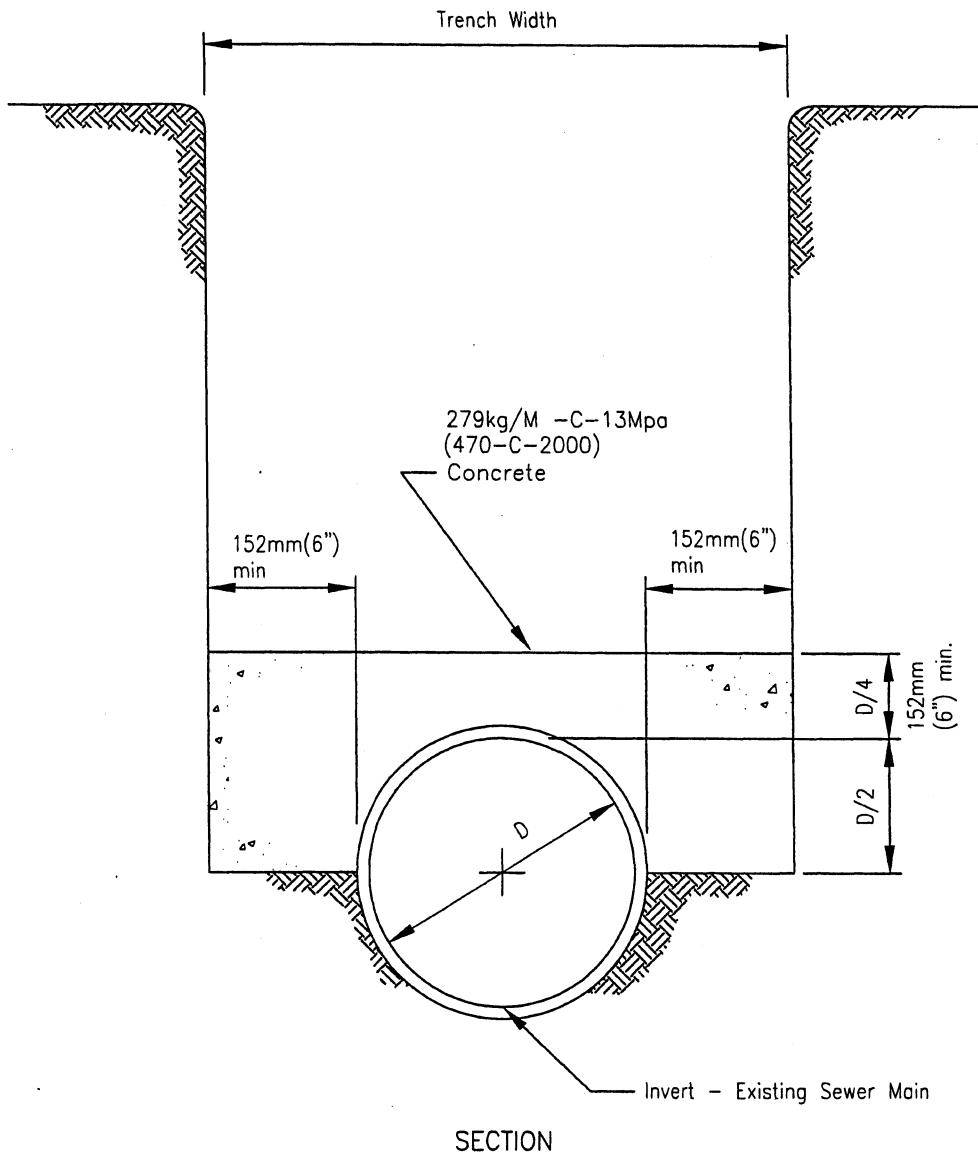


SIDE ELEVATION

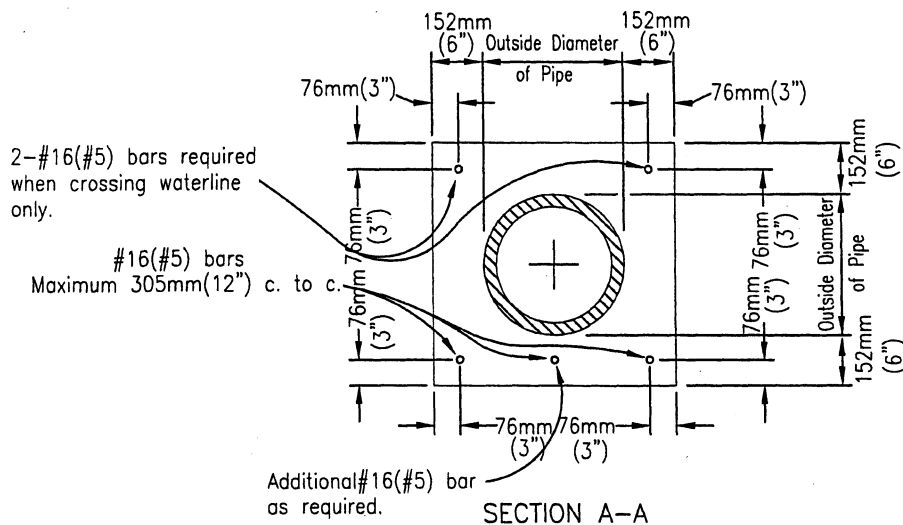
LEGEND ON PLANS




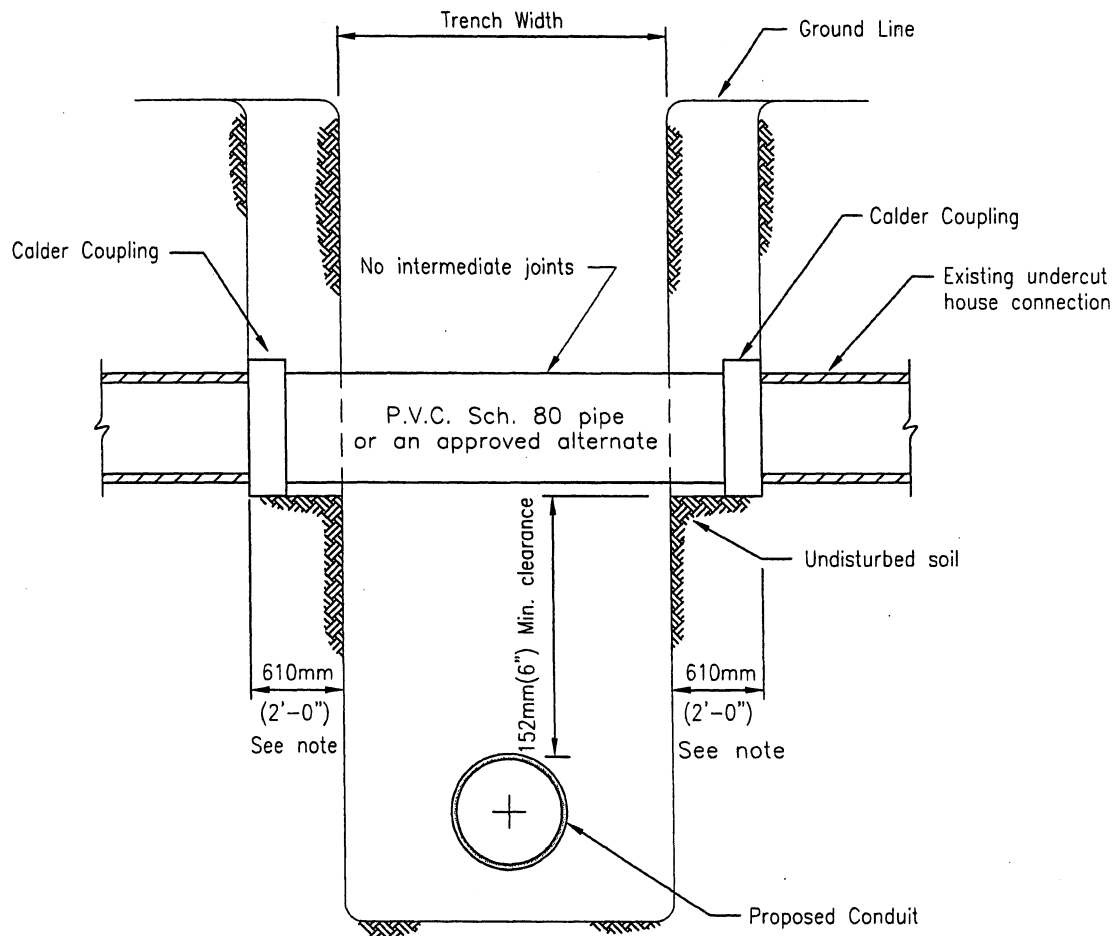
Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING		CITY OF SAN DIEGO	
Original	R.A.	A. Oskoui	12/06			STANDARDS COMMITTEE	
				CUTOFF WALL		<i>H. Hall</i> 12/16/06	
						COORDINATOR R.C.E 65271 Date	
						DRAWING	
						NUMBER	
						SDS-115	



Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING		CITY OF SAN DIEGO STANDARDS COMMITTEE	
Original	R.A.	A. Oskoui	12/06			<i>M. Ghafari</i> 12/16/6	
				CONCRETE PROTECTION FOR EXISTING SEWER PIPE		COORDINATOR R.C.E 65271 Da	
						DRAWING	
						NUMBER	
						SDS-116	



Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE	
Original	R.A.	A. Oskoui	12/06		 12/16/06 COORDINATOR R.C.E 65271 Da	
				CONCRETE SUPPORT FOR UNDERCUT SEWER PIPE	DRAWING	
					NUMBER	
					SDS-117	

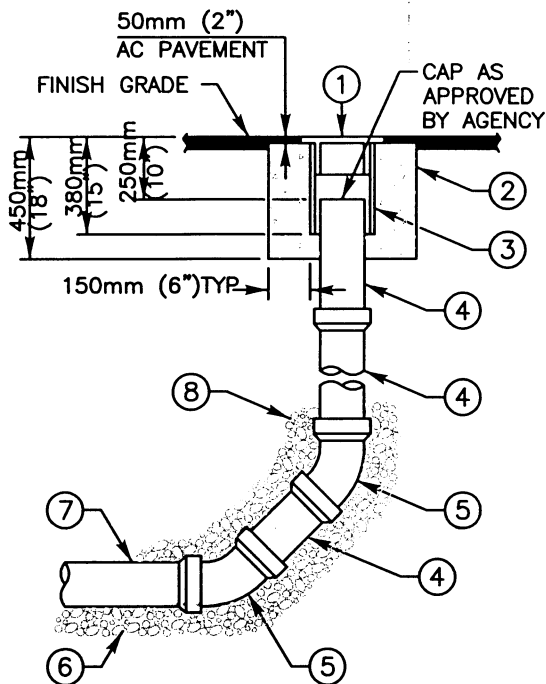


SECTION

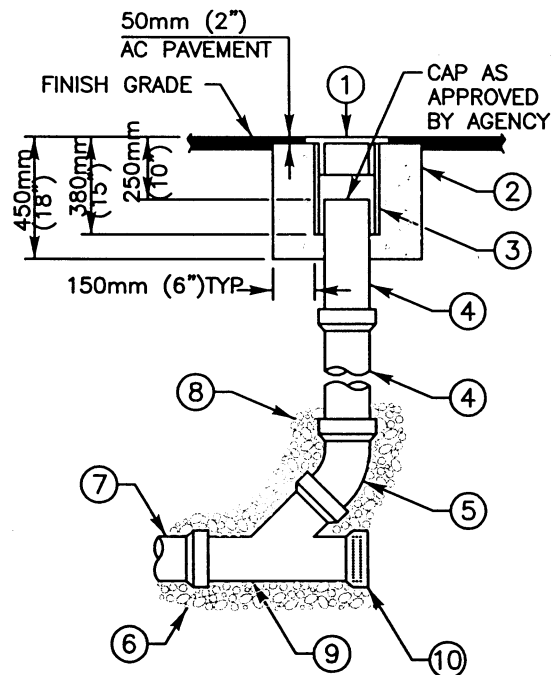
NOTE

For water line construction, repair pipe shall extend to first joint beyond 610mm(2') at both sides of trench or to a distance of 1.22m (4'), whichever is less.

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING		CITY OF SAN DIEGO	
Original	R.A.	A. Oskoui	12/06			STANDARDS COMMITTEE	
				HOUSE CONNECTION SEWER REPAIR		<i>M. H. H. 12/16/06</i>	
						COORDINATOR R.C.E 65271 Da	
						DRAWING	SDS-118
						NUMBER	



TYPE A
MAINS FOR 150mm (6")
AND 200mm (8")



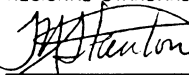
TYPE B
SEWER LATERAL
CLEANOUT

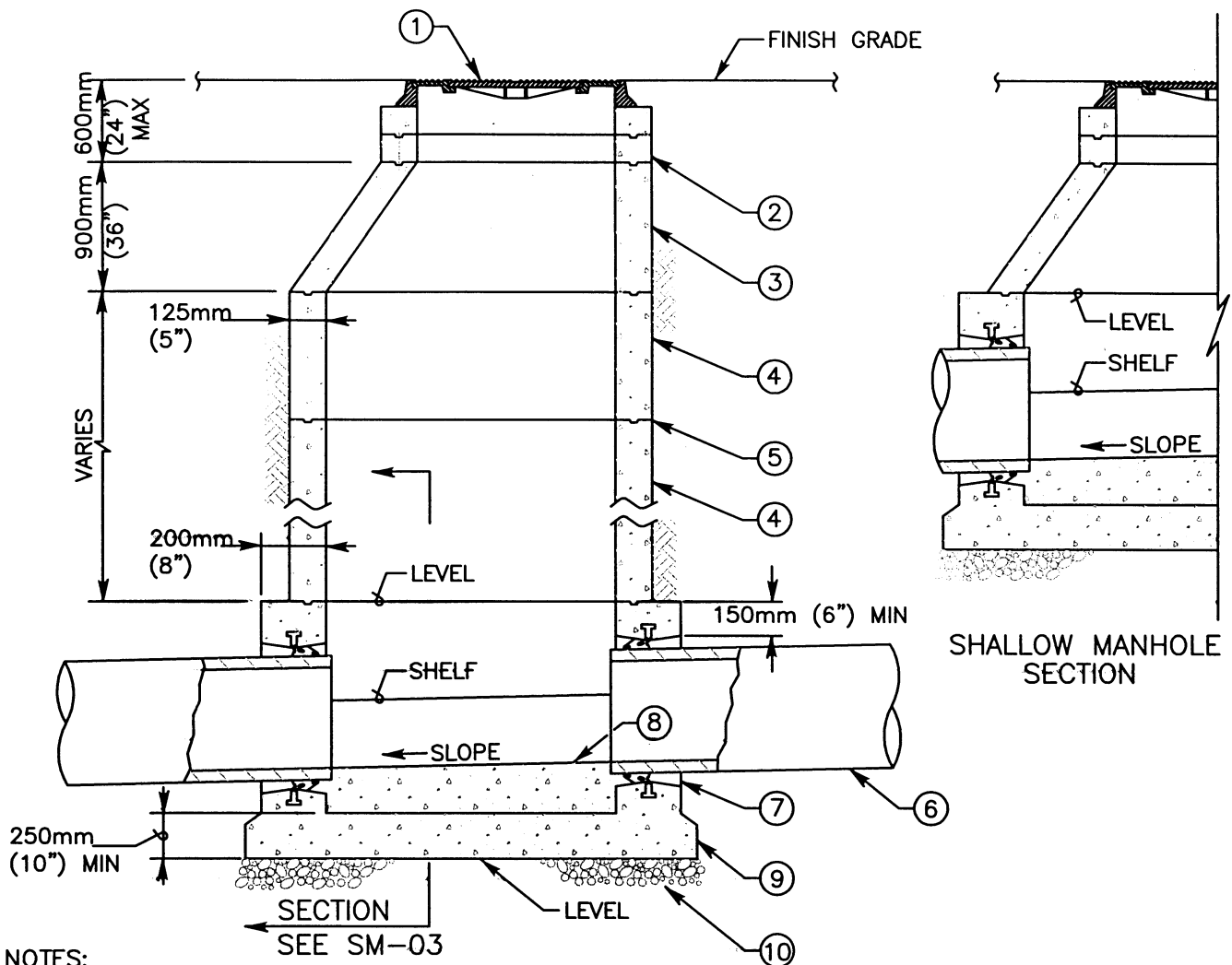
NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) CLEANOUTS TO BE INSTALLED AT THE END OF MAINS WHERE INDICATED ON THE PLANS
- 3) CLEANOUT PIPE TO BE SAME SIZE AND MATERIAL AS SEWER MAIN UP TO 200mm (8")
- 4) BACKFILL TO TOP OF 45° BEND WITH 19mm (3/4") CRUSHED ROCK
- 5) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

—○—
LEGEND ON PLANS


ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	300mm (12") CI CLEANOUT BOX COVER MARKED 'SEWER' AND AGENCY NAME AS REQUIRED	⑤	45° ELBOW
②	CONCRETE RING	⑥	19mm (3/4") CRUSHED ROCK PIPE BEDDING
③	300mm (12") PVC, C-900 x 380mm (15") LONG (CLEANOUT BOX)	⑦	SEWER MAIN
④	SIZE x REQUIRED LENGTH PVC PIPE	⑧	19mm (3/4") CRUSHED ROCK SEE NOTE 4
		⑨	STANDARD WYE BRANCH
		⑩	INSTALL PLUG AND CONCRETE LUG

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING SEWER CLEANOUT	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  03/24/2005 Chairperson R.C.E. 19246 Date
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
Replaced S-03		J. Tomasulo	03/05		
					DRAWING NUMBER SC-01

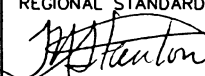


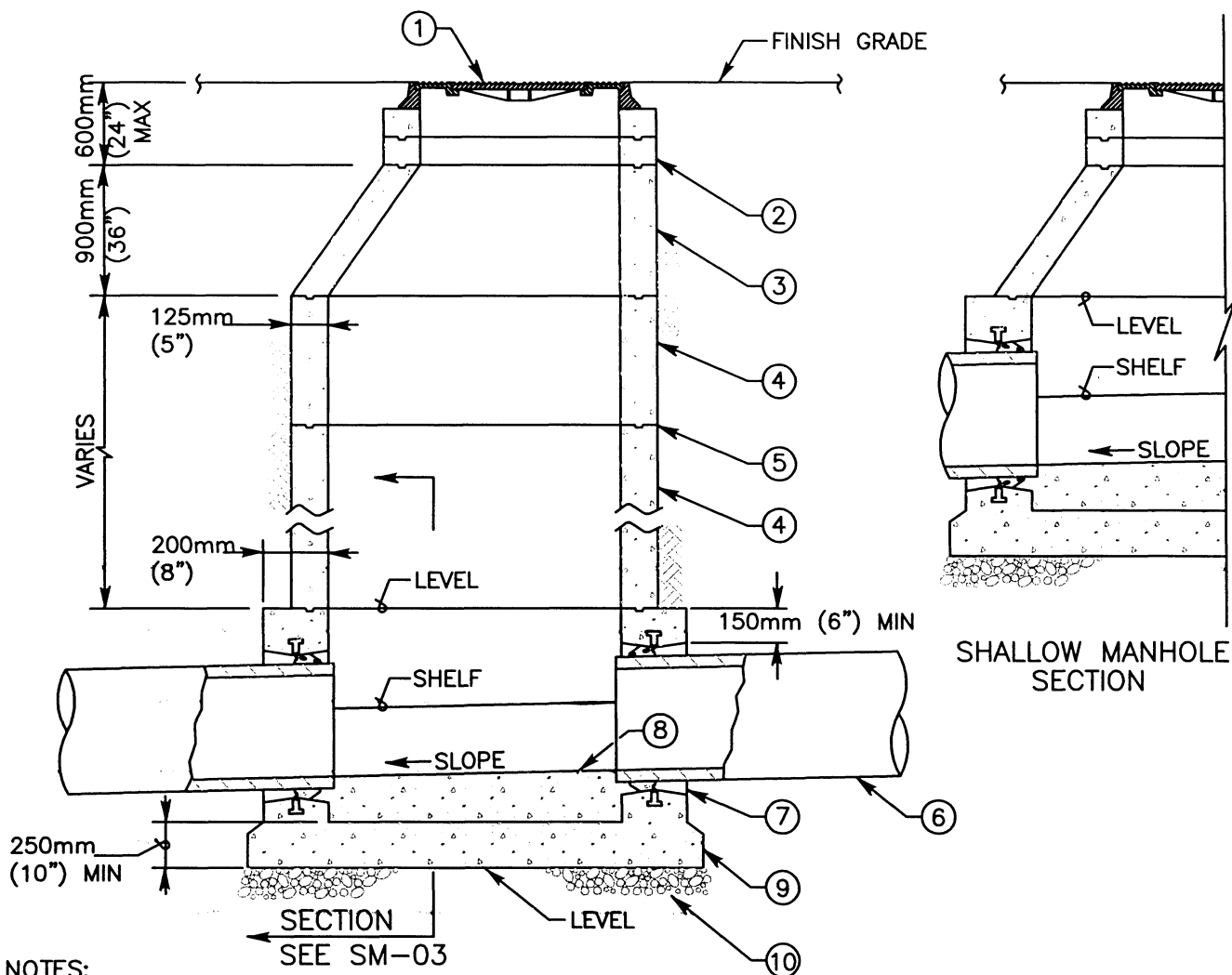
NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) VERTICAL WALL OF CONE TO BE ON THE UPSTREAM SIDE OF MANHOLE SEE SM-05 FOR ACCESS LOCATIONS
- 3) FOR MANHOLE BASES SEE SM-03
- 4) MANHOLES FOR MAINS 450mm (18") AND LARGER SHALL BE COATED AND LINED PER SM-07
- 5) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

1200mm (48")

 LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	900mm (36") MANHOLE FRAME AND TWO CONCENTRIC COVERS SEE S.D.R.S.D. M-3	⑤	WATER TIGHT JOINTS SEE SM-05
②	900mm (36") DIA GRADE RING(S) 150mm (6") TO 450mm (18") HIGH	⑥	SEWER MAIN
③	ECCENTRIC CONE SEE NOTE 2	⑦	MANHOLE PIPE CONNECTOR SEE SM-04
④	1200mm (48") DIA RING(S) VARIABLE HEIGHT	⑧	FIELD INSTALLED INVERT SEE SM-04
		⑨	CONCRETE BASE, PRECAST OR CAST IN PLACE
		⑩	150mm (6") OF 19mm (3/4") CRUSHED ROCK

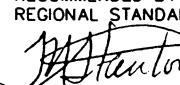
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING 1200mm (48") DIAMETER PRECAST MANHOLE INSTALLATION	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  03/24/2005 Chairperson R.C.E. 19246 Date
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
Replaced S-02		J. Tomasulo	03/05		
					DRAWING NUMBER SM-01

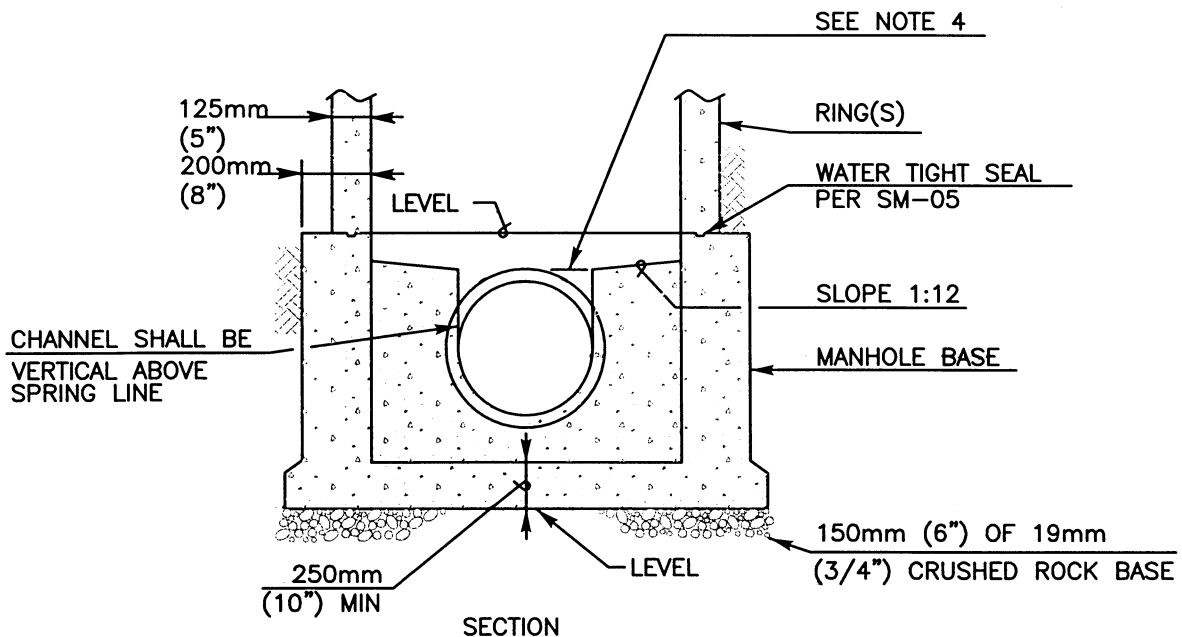


NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) VERTICAL WALL OF CONE TO BE ON THE UPSTREAM SIDE OF MANHOLE SEE SM-05 FOR ACCESS LOCATIONS
- 3) FOR MANHOLE BASES SEE SM-03
- 4) MANHOLES FOR MAINS 450mm (18 inch) AND LARGER SHALL BE COATED AND LINED PER SM-07
- 5) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

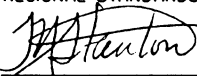
ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	900mm (36 inch) MANHOLE FRAME AND TWO CONCENTRIC COVERS SEE S.D.R.S.D. M-3	⑤	WATER TIGHT JOINTS SEE SM-05
②	900mm (36 inch) DIA GRADE RING(S) 150mm (6 inch) TO 450mm (18 inch) HIGH	⑥	SEWER MAIN
③	ECCENTRIC CONE SEE NOTE 2	⑦	MANHOLE PIPE CONNECTOR SEE SM-04
④	1500mm (60 inch) DIA RING(S) VARIABLE HEIGHT	⑧	FIELD INSTALLED INVERT SEE SM-04
		⑨	CONCRETE BASE, PRECAST OR CAST IN PLACE
		⑩	150mm (6 inch) OF 19mm (3/4 inch) CRUSHED ROCK

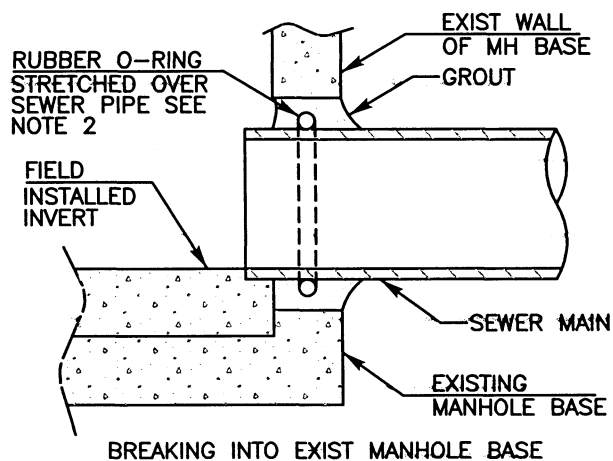
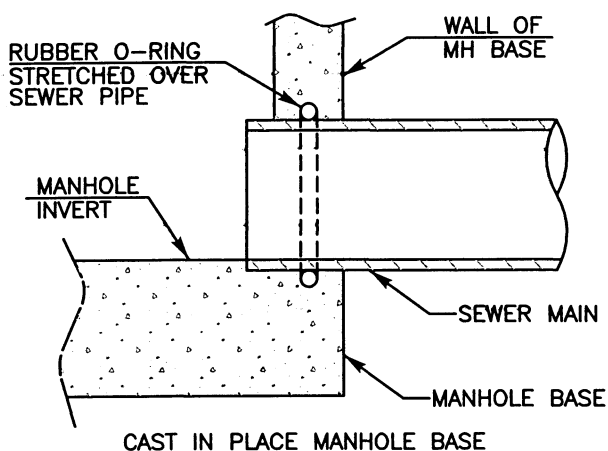
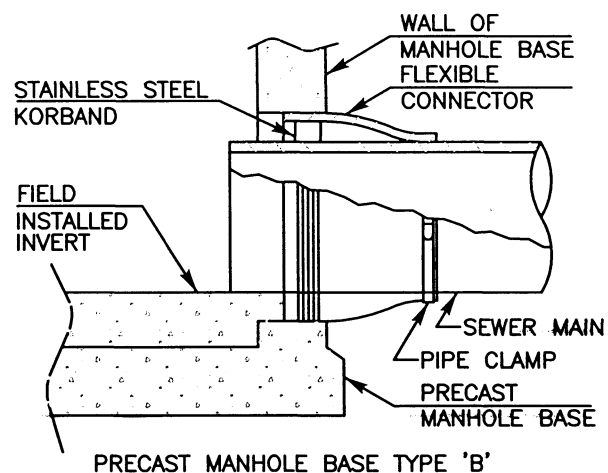
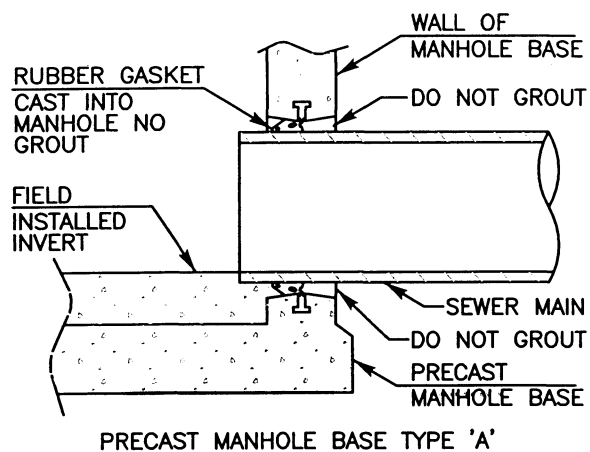
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75			 03/24/2005 Chairperson R.C.E. 19246 Date	
Add Metric		T. Stanton	03/03				
Replaced S-02		J. Tomasulo	03/05				
				1500mm (60") DIAMETER PRECAST MANHOLE INSTALLATION		DRAWING NUMBER	
						SM-02	



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) FOR MANHOLE INSTALLATIONS SEE SM-01 AND SM-02
- 3) MANHOLE BASES FOR MAINS 450mm (18") AND LARGER SHALL BE COATED PER SM-07
- 4) LOWEST POINT ON SHELF SHALL BE EVEN WITH TOP OF PIPE
- 5) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

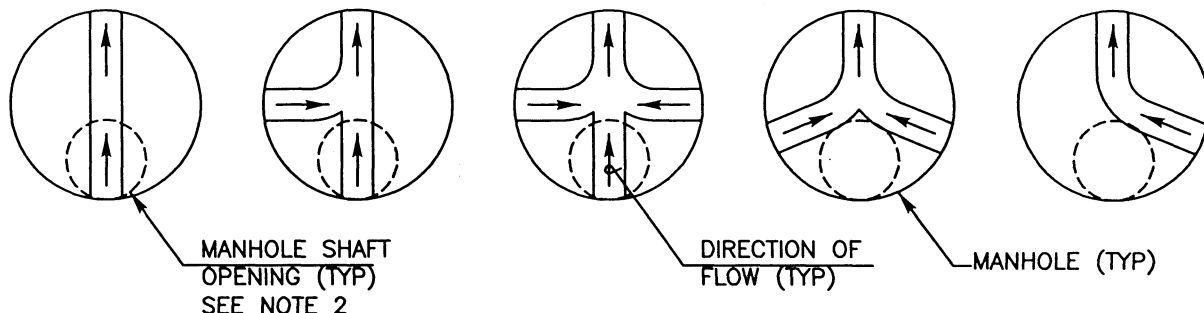
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03	SEWER MANHOLE BASE	 03/24/2005 Chairperson R.C.E. 19246 Date
Replaced S-02		J. Tomasulo	03/05		
					DRAWING NUMBER
					SM-03



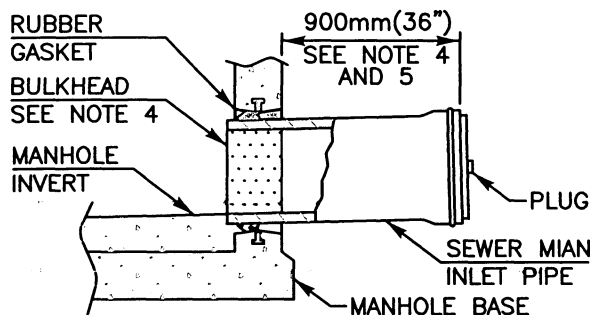
NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) A RUBBER O-RING OR A FLEXIBLE CONNECTOR (AS SHOWN IN PRECAST MANHOLE BASE TYPE 'B') CAN BE USED WHEN BREAKING INTO EXISTING MANHOLE
- 3) FOR MANHOLES REQUIRING COATING AND LINING SEE SM-07
- 4) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

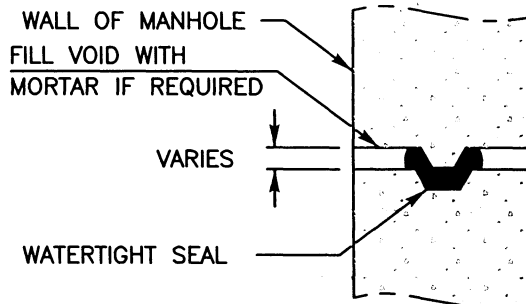
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING MANHOLE PIPE CONNECTORS	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>T. Stanton</i> 03/24/2005 Chairperson R.C.E. 19246 Date
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
Replaced S-02		J. Tomasulo	03/05		
					DRAWING NUMBER SM-04



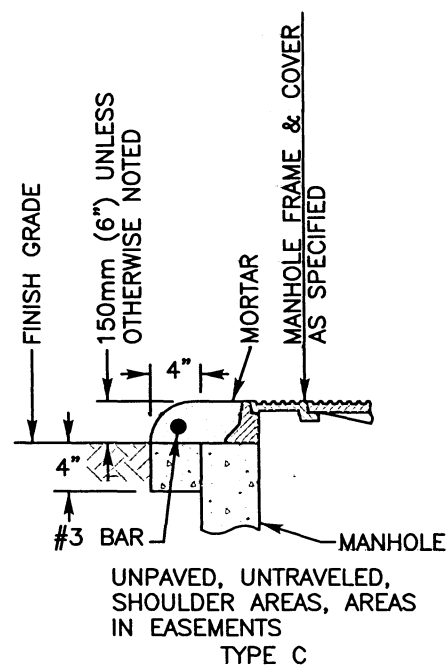
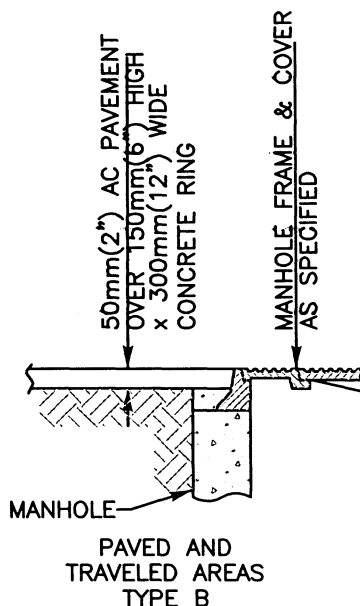
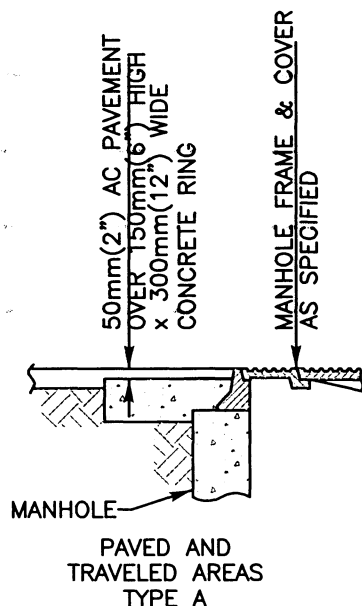
MANHOLE ACCESS LOCATION PLAN VIEW



MANHOLE STUB OUT FOR FUTURE CONNECTION



WATERTIGHT MANHOLE JOINT



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) VERTICAL WALL OF CONE TO BE ON THE UP STREAM SIDE OF MANHOLE
- 3) FOR MANHOLES REQUIRING COATING AND LINING SEE SM-07
- 4) BULKHEADS SHALL BE INSTALLED AT THE MANHOLE END OF STUBS
- 5) SEWER MAIN TO BE LAID WITH BELLS UP-GRADE
- 6) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-02		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

MANHOLE MISCELLANEOUS
DETAILS

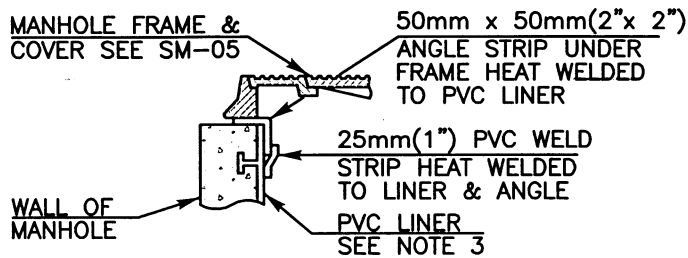
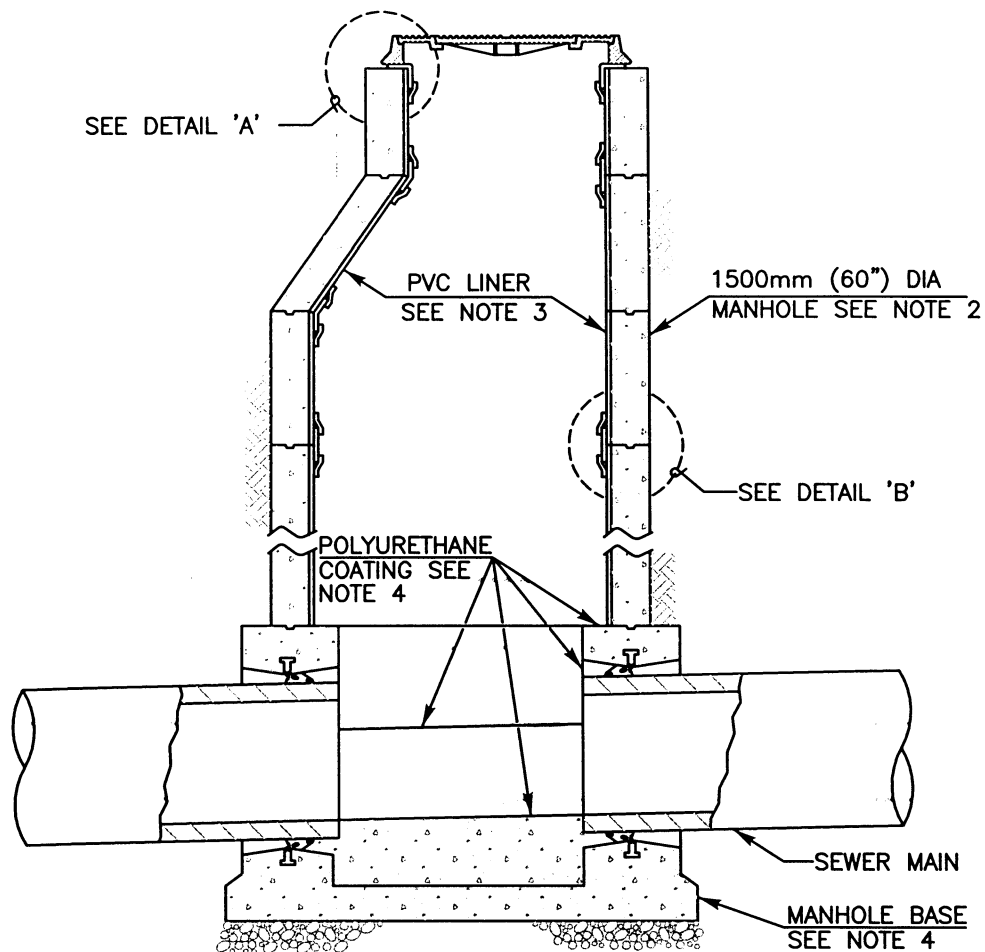
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 03/24/2005

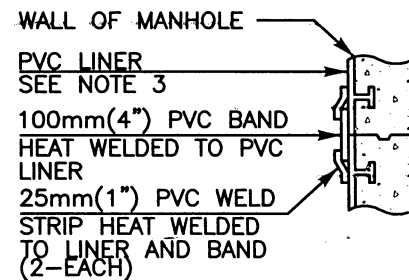
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER SM-05

NOT USED



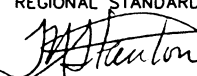
DETAIL "A" MANHOLE
FRAME & COVER

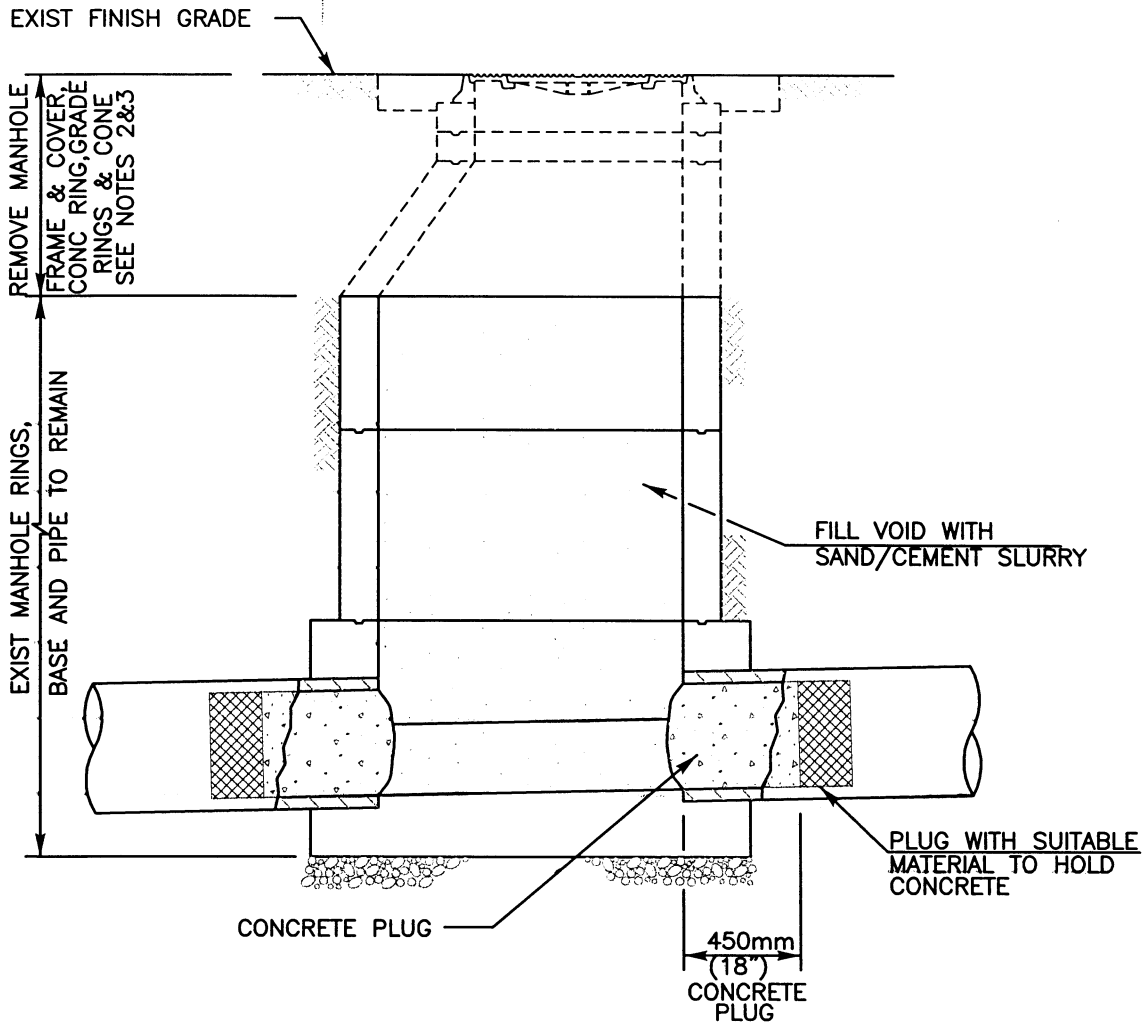


DETAIL "B" MANHOLE
JOINT SECTIONS

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) MANHOLES FOR SEWER MAINS 450mm(18") AND LARGER SHALL BE COATED AND LINED
- 3) MANHOLE SHAFT AND CONE SECTIONS, AND GRADE RINGS SHALL HAVE A PVC LINER PLACED WITH T-SHAPED SUPPORTS INTEGRALLY CAST INTO THE CONCRETE
- 4) ELASTOMERIC POLYURETHANE COATING SHALL BE APPLIED TO THE INTERIOR OF MANHOLE BASES
- 5) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75	MANHOLE COATING AND LINING SYSTEM		 03/24/2005 Chairperson R.C.E. 19246 Date
Add Metric		T. Stanton	03/03			
Replaced S-02		J. Tomasulo	03/05			
						DRAWING NUMBER SM-07



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) ALL SALVAGED MATERIAL BECOMES PROPERTY OF AGENCY OF JURISDICTION
- 3) BACKFILL PER AGENCY'S REQUIREMENT
- 4) FOR CUTTING & PLUGGING ABANDONED SEWER MAINS SEE WP-03

—○—
LEGEND ON PLANS

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-02		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

**EXISTING MANHOLE
ABANDONMENT**

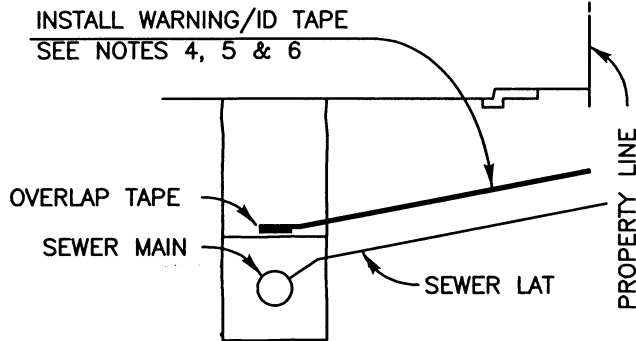
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 03/24/2005

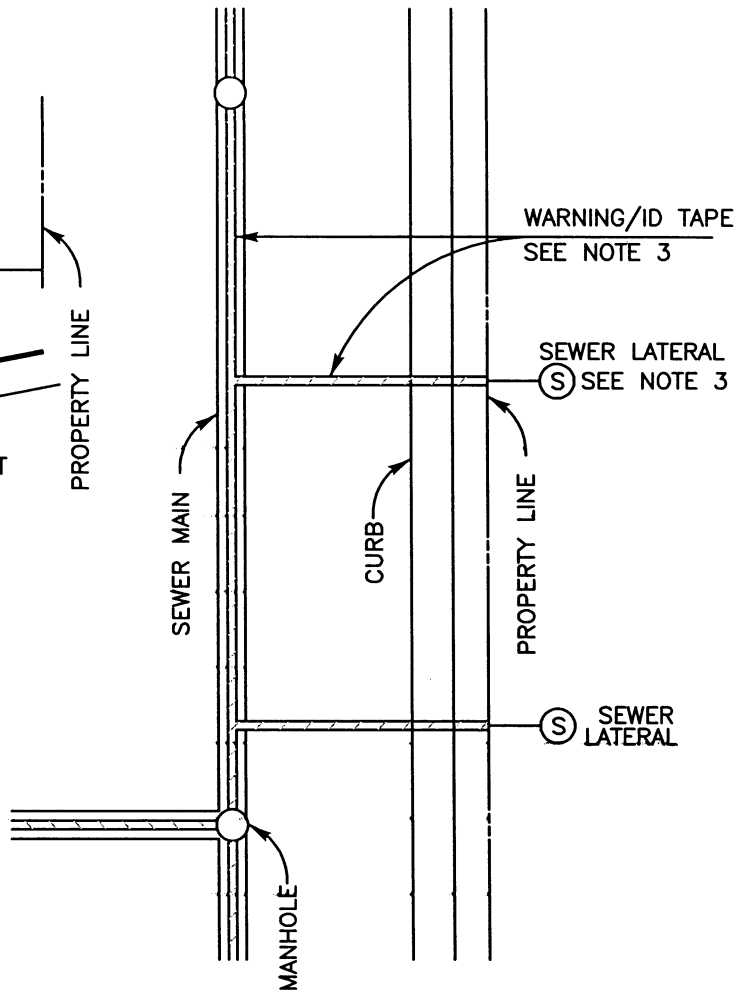
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

SM-08



SECTION AT SEWER LATERALS



PLAN

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) WARNING/IDENTIFICATION TAPE SHALL BE INSTALLED AS SPECIFIED BY AGENCY
- 3) STAMP OR CHISEL A 50mm (2") HIGH 'S' IN CURB FACE TO IDENTIFY SEWER LATERAL LOCATION
- 4) FOR SEWER LATERALS EXTEND TAPE TO PROPERTY LINE
- 5) DEPTH OF WARNING/IDENTIFICATION TAPE AS SPECIFIED BY AGENCY
- 6) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-19		J. Tomasulo	03/05

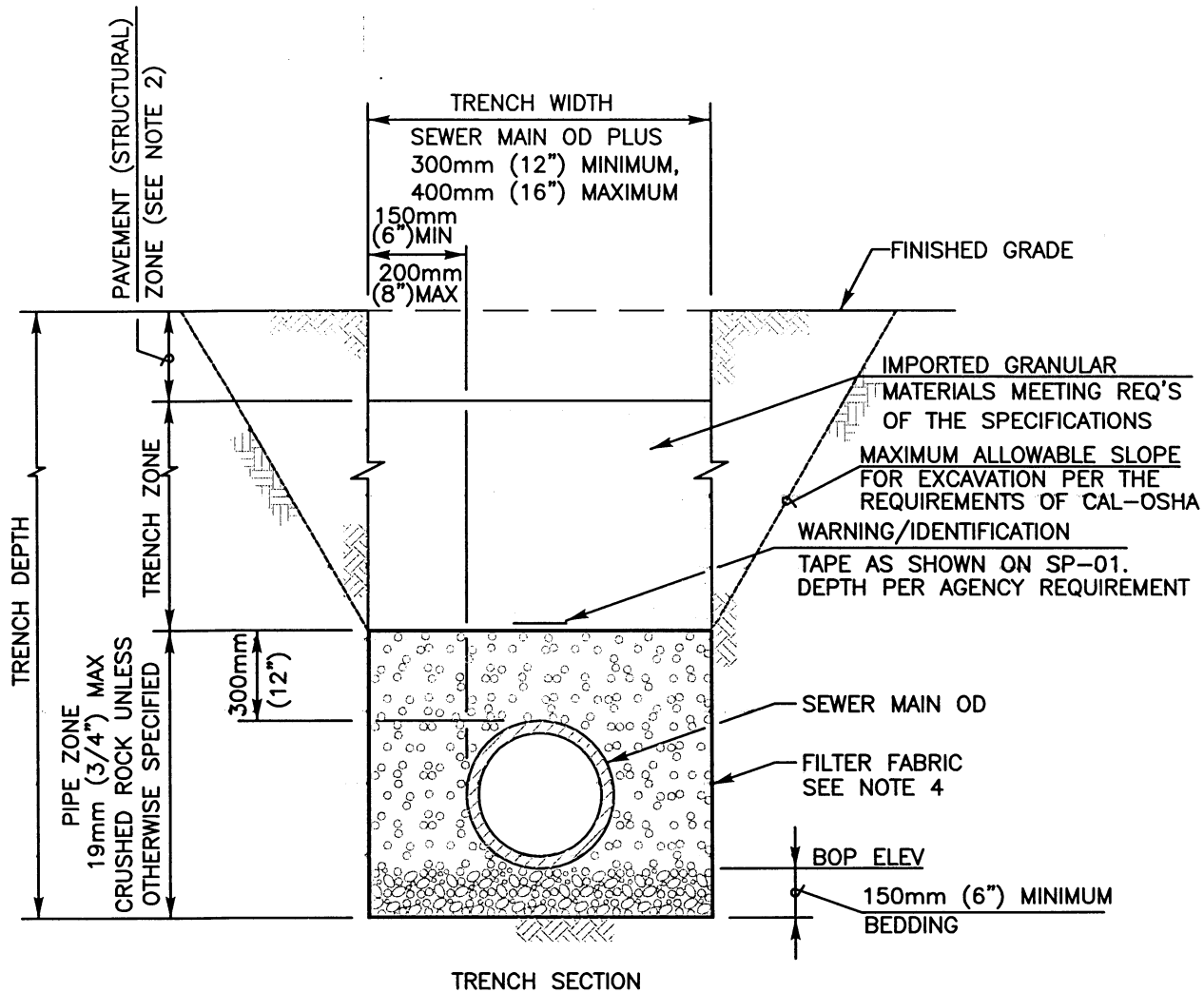
SAN DIEGO REGIONAL STANDARD DRAWING

WARNING/IDENTIFICATION
TAPE INSTALLATION

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 03/24/2005
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER SP-01



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS FOR TRENCHING, BACKFILLING AND COMPACTING WHERE APPLICABLE
- 2) PAVING OR PAVEMENT REPAIR TO BE DONE IN ACCORDANCE WITH AGENCY OF JURISDICTION
- 3) EXCAVATE BELL HOLES AT EACH JOINT TO PERMIT PROPER ASSEMBLY AND INSPECTION OF THE ENTIRE JOINT
- 4) FILTER FABRIC AS REQUIRED BY AGENCY OF JURISDICTION (WITH A MINIMUM 12" OVERLAP).

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-04		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

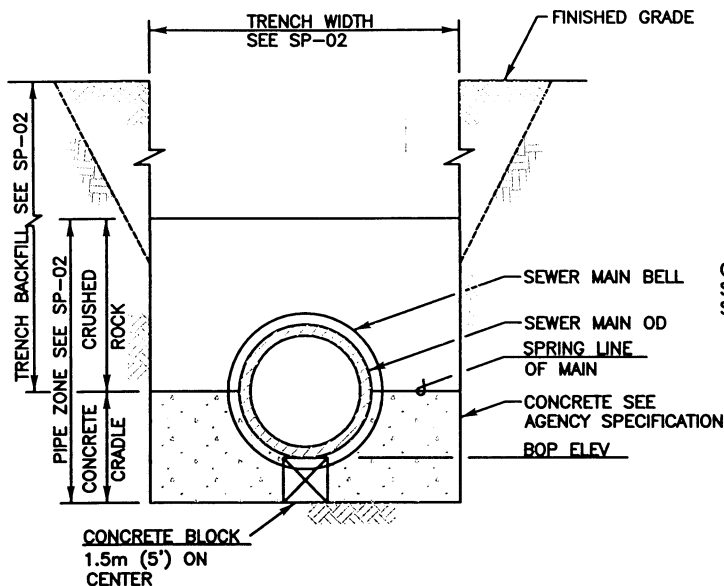
**PIPE BEDDING AND TRENCH
BACKFILL FOR SEWER FACILITIES**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

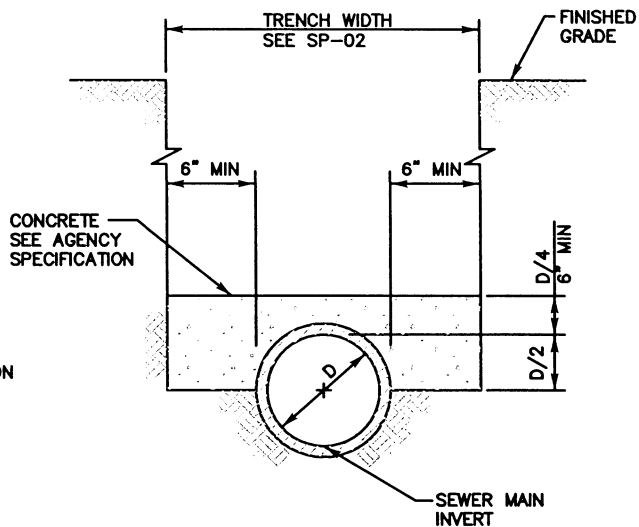
T. Stanton 03/24/2005

Chairperson R.C.E. 19246 Date

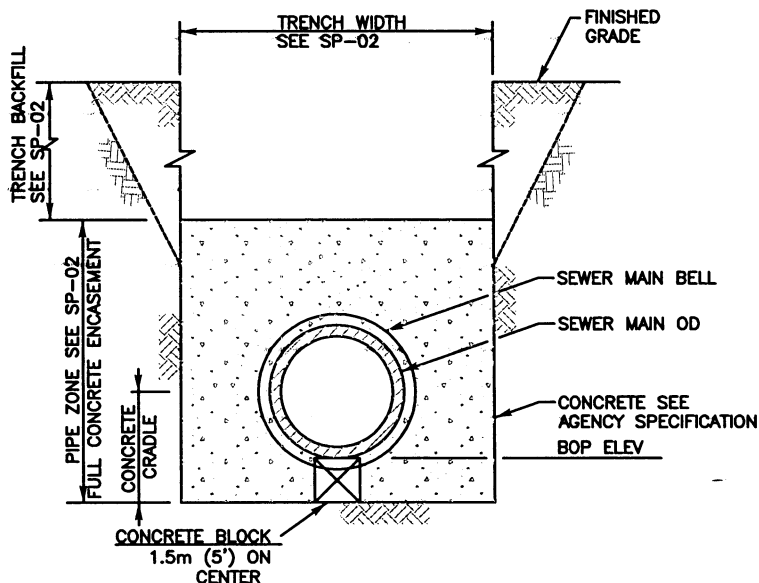
DRAWING
NUMBER **SP-02**



TRENCH SECTION
CONCRETE PIPE CRADLE



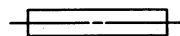
TRENCH SECTION
CONCRETE PROTECTION



TRENCH SECTION
CONCRETE PIPE ENCASEMENT

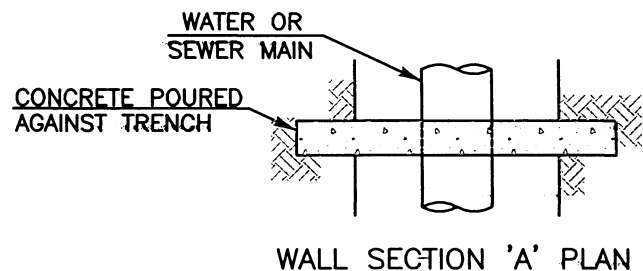
NOTES:


- 1) REFER TO AGENCY SPECIFICATIONS FOR TRENCHING, BACKFILLING AND COMPACTING WHERE APPLICABLE
- 2) CONCRETE CRADLE SHALL BE USED WHEN THE TRENCH WIDTH AT THE UPPER LIMIT OF THE PIPE ZONE EXCEEDS THE MAX WIDTH SPECIFIED ON SP-02 AND OR DIRECTED BY AGENCY'S ENGINEER
- 3) FOR PIPE BEDDING AND TRENCH BACKFILL SEE SP-02

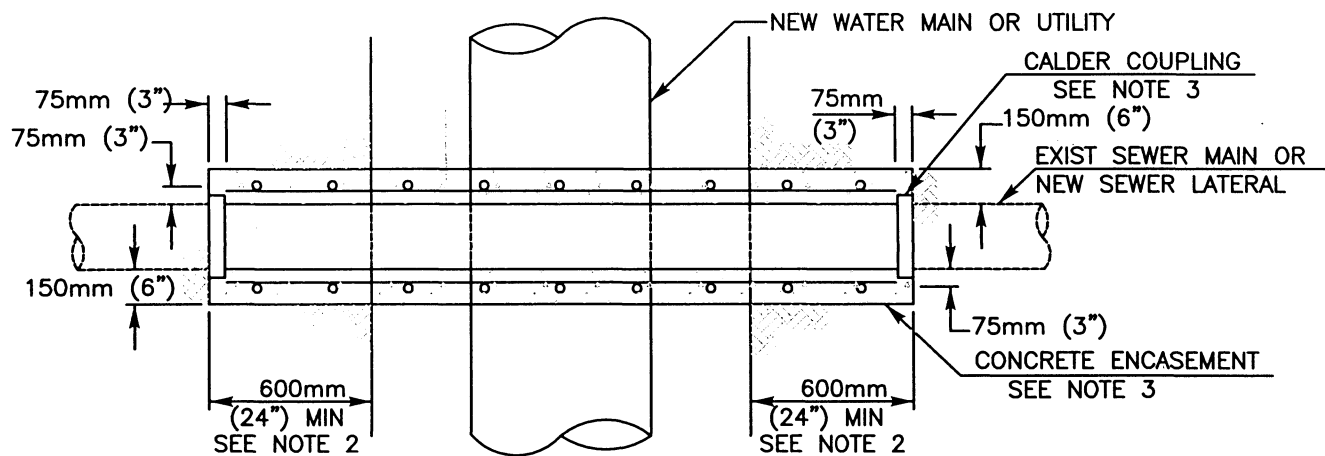


LEGEND ON PLANS

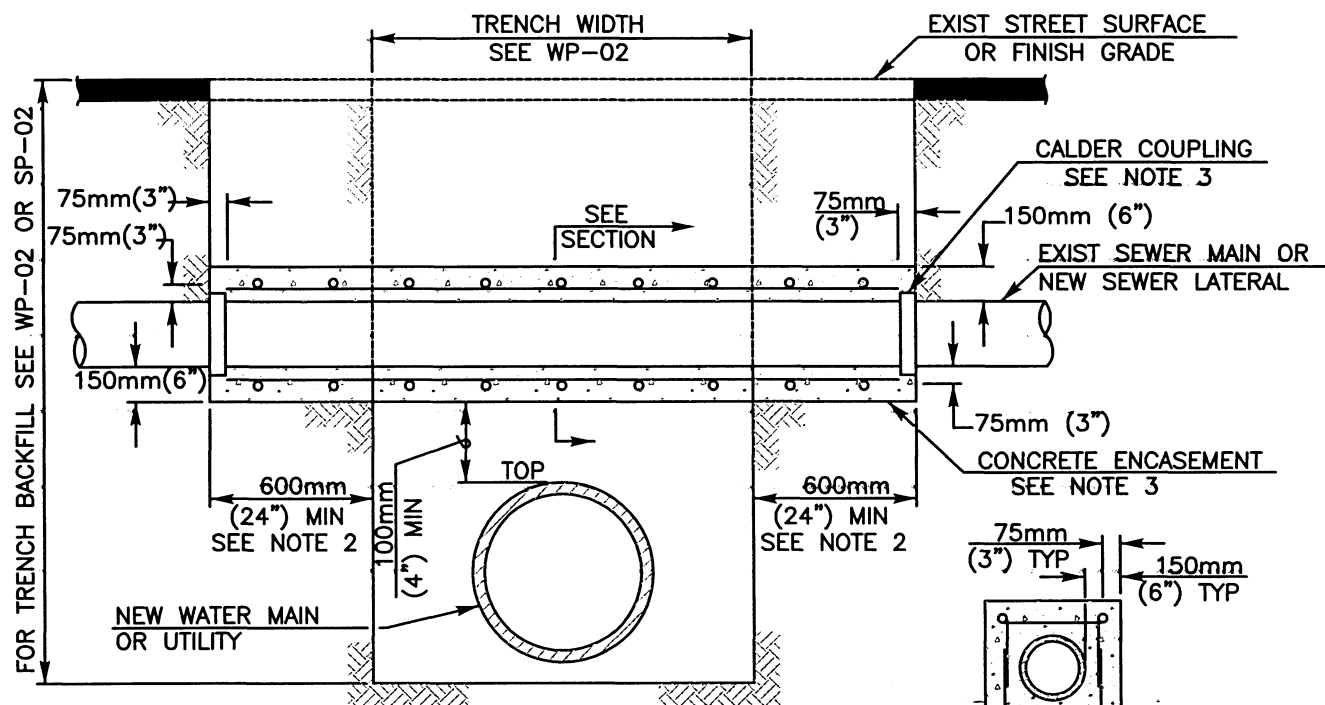
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03	CONCRETE PROTECTION FOR SEWER PIPE	 Chairperson R.C.E. 19246 Date
Replaced S-06		J. Tomasulo	03/05		
					DRAWING NUMBER
					SP-03



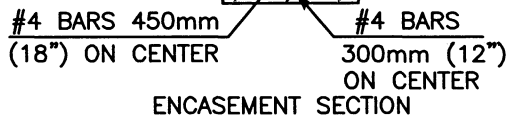
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  03/24/2005
ORIGINAL		J. Tomasulo	03/05		
				CUT-OFF WALL INSTALLATION IN TRAVELED AREAS	Chairperson R.C.E. 19246 Date
					DRAWING NUMBER SP-07



PLAN

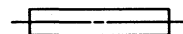


ELEVATION



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS FOR PROTECTION OF EXISTING FACILITIES
- 2) ENCASEMENT SHALL EXTEND TO FIRST JOINT BEYOND BOTH SIDES OF TRENCH [600mm (24") MIN 1200mm (48") MAX OF SUITABLE NATIVE SUPPORT BEYOND EDGE OF TRENCH].
- 3) CONCRETE ENCASEMENT REQUIRED FOR SEWER MAINS ONLY. CALDER COUPLINGS REQUIRED FOR SEWER LATERALS ONLY. SEWER LATERALS TO BE REPLACED WITH SCH. 80 PVC WITH NO INTERMEDIATE JOINTS.
- 4) FOR PIPE BEDDING AND TRENCH BACKFILL SEE WP-02 OR SP-02.



LEGEND ON PLANS

Revision	By	Approved	Date
ORIGINAL		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

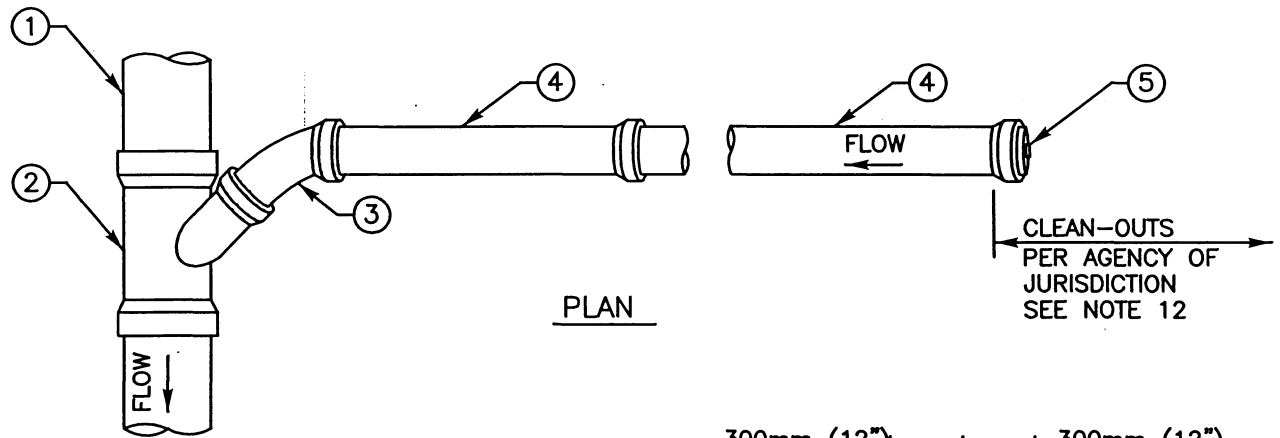
PIPE SUPPORT FOR UNDERCUT
SEWER MAINS OR SEWER LATERALS

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

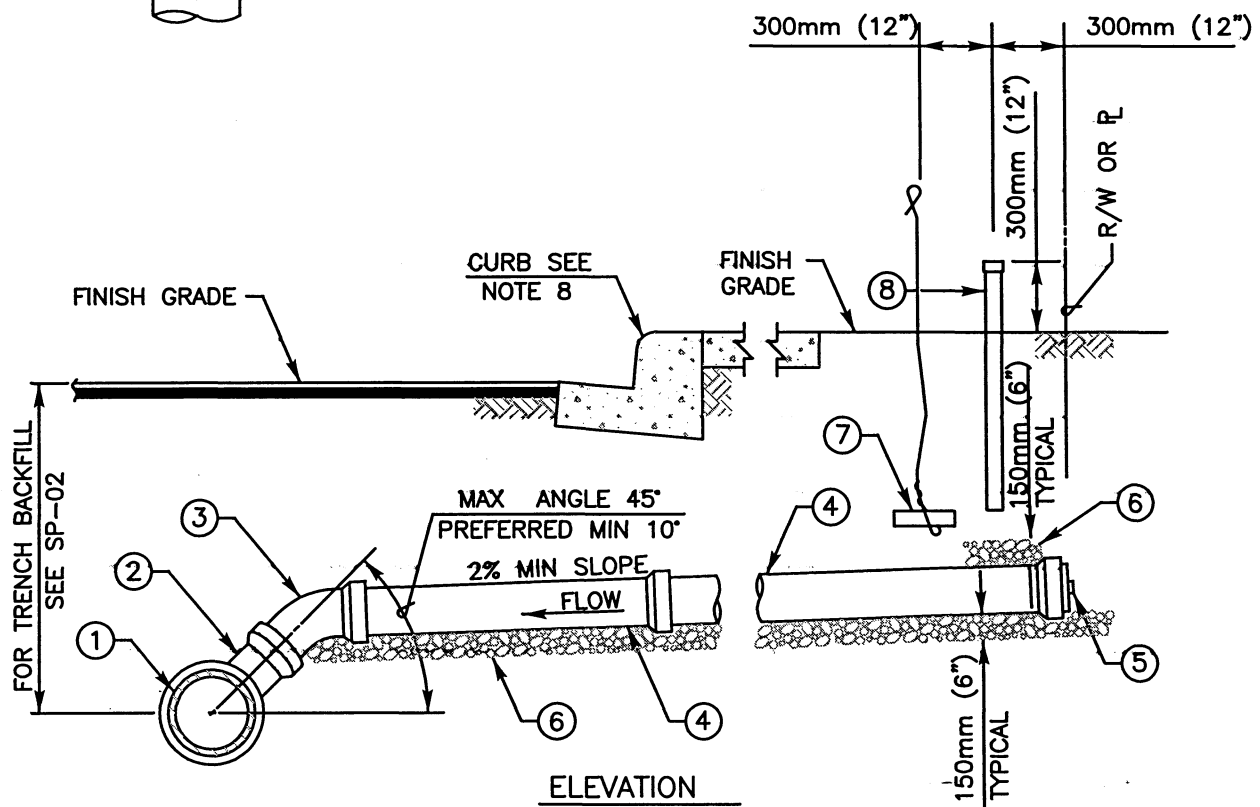
[Signature] 03/24/2005

Chairperson R.C.E. 19246 Date

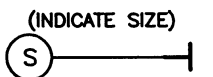
DRAWING
NUMBER SP-09



PLAN



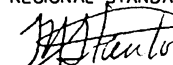
ELEVATION

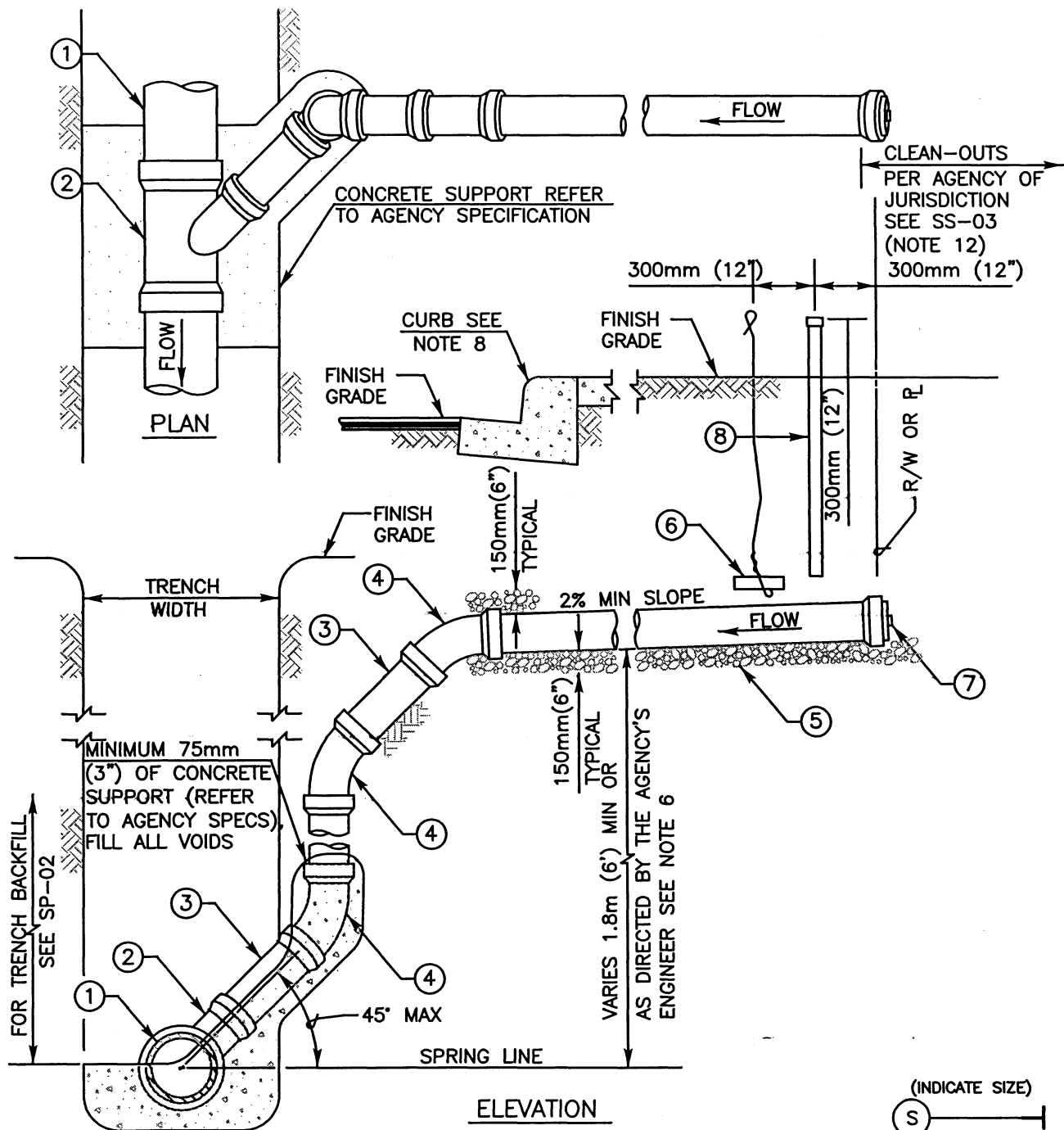


FOR SEWER LATERAL NOTES SEE DETAIL SS-03

LEGEND ON PLANS

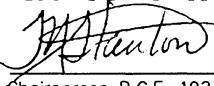
ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	SEWER MAIN	⑤	PLUG OR CAP
②	45° WYE	⑥	19mm (3/4") MAXIMUM CRUSHED ROCK
③	45° ELBOW	⑦	#9 WIRE ATTACHED TO A BRICK
④	PIPE LATERAL SEE NOTE 3 & 5	⑧	100mm (4") PVC PIPE WITH GLUED CAP

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING 100mm (4") AND 150mm (6") SEWER LATERAL INSTALLATION	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  03/24/2005 Chairperson R.C.E. 19246 Date DRAWING NUMBER SS-01
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
Replaced S-13		J. Tomasulo	03/05		

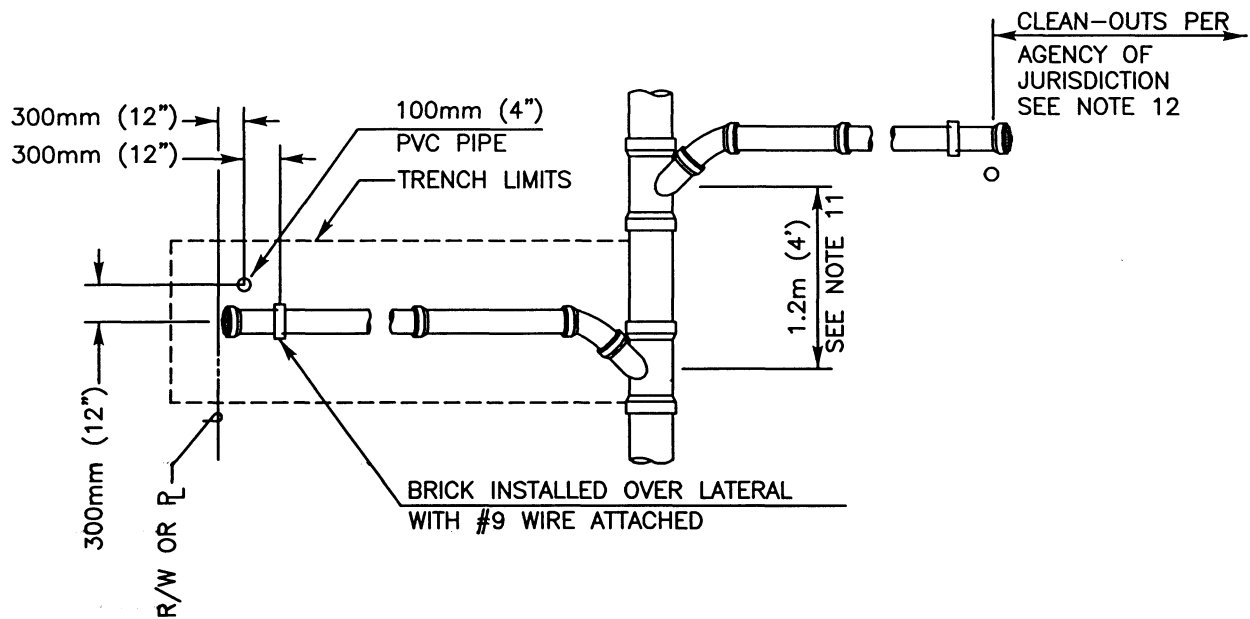


FOR SEWER LATERAL NOTES SEE DETAIL SS-03

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	SEWER MAIN	⑤	19mm (3/4") MAXIMUM CRUSHED ROCK
②	45° WYE	⑥	#9 WIRE ATTACHED TO A BRICK
③	PIPE	⑦	PLUG OR CAP
④	45° ELBOW	⑧	100mm (4") PVC PIPE WITH GLUED CAP

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING 100mm (4") AND 150mm (6") DEEP-CUT SEWER LATERAL INSTALLATION	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  03/24/2005 Chairperson R.C.E. 19246 Date DRAWING NUMBER SS-02
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
Replaced S-13		J. Tomasulo	03/05		

NOT USED



SEWER LATERAL DETAIL
SEE NOTE 10 BELOW

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) IN NO CASE SHALL LATERAL CONNECT DIRECTLY ON TOP OF SEWER MAIN
- 3) LATERAL SHALL BE INSTALLED TO PROPERTY LINE UNLESS SPECIFIED ON PLANS
- 4) MINIMUM 1.2m (4') COVER ABOVE LATERAL AT PROPERTY LINE
- 5) LATERAL TO HAVE A MINIMUM SLOPE OF 2%
- 6) VERTICAL PIPE SHALL BE BRACED WHILE BACKFILLING TRENCH
- 7) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON SP-01
- 8) STAMP OR CHISEL A 50mm (2") HIGH "S" IN CURB FACE OVER LATERAL TO IDENTIFY SEWER LATERAL LOCATION
- 9) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST
- 10) FOR SEWER LATERAL INSTALLATIONS SEE SS-01 AND SS-02
- 11) FOR SEWERS SPECIFIED AS PVC PIPE, A MINIMUM 0.9m (3') SECTION OF PIPE IS REQUIRED BETWEEN FITTINGS
- 12) SEWER CLEAN-OUT SEE SC-01 TYPE B AS REQUIRED BY AGENCY OF JURISDICTION

(INDICATE SIZE)
S ————
LEGEND ON PLANS

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-13		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

SEWER LATERAL NOTES AND DETAIL

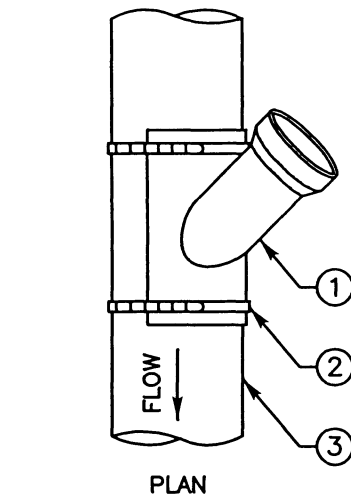
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 03/24/2005

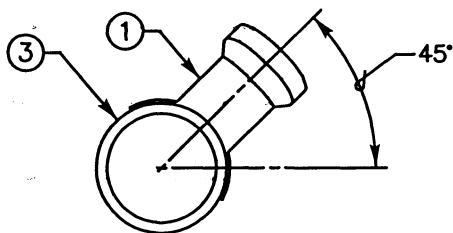
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER SS-03

NOT USED

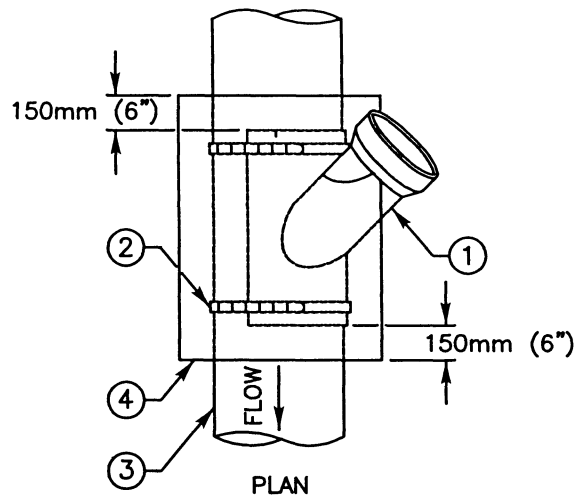


PLAN

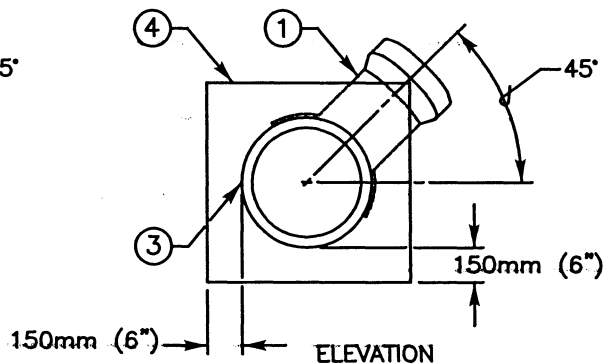


ELEVATION

CUT IN WYE CONNECTION
TYPE A



PLAN



ELEVATION

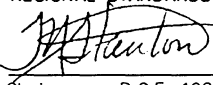
CUT IN WYE CONNECTION
TYPE B

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) CONNECTIONS TO EXISTING SEWER MAINS TO BE MADE BY AGENCY PERSONNEL IN ACCORDANCE WITH SPECIFICATIONS UNLESS OTHERWISE NOTED ON PLANS
- 3) IN NO CASE SHALL CONNECTION BE MADE DIRECTLY ON TOP OF SEWER MAIN
- 4) NO MORE THAN ONE CUT IN WYE WILL BE ALLOWED FOR EACH LENGTH OF EXISTING VCP SEWER MAIN
- 5) FOR SEWER LATERAL INSTALLATION SEE SS-01 AND SS-02
- 6) FOR TRENCH BACKFILL SEE SP-02
- 7) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

(INDICATE SIZE)
S ——— I
LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	45° SADDLE WYE WITH GASKET	③	EXISTING SEWER MAIN
②	STAINLESS STEEL HOSE CLAMPS (2-EACH)	④	CONCRETE ENCASEMENT

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING 100mm (4") AND 150mm (6") SEWER CUT-IN WYE CONNECTIONS	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  03/24/2005 Chairperson R.C.E. 19246 Date DRAWING NUMBER SS-04
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
Replaced S-13		J. Tomasulo	03/05		

NOT USED